RAILROAD GAZETTE

FRIDAY, MARCH 11, 1881.

Judge Black's Charges of Railroad Extortion.

The New York *World* has published two letters from Mr. Albert Fink in reply to Judge Black's charge of monstrous extortion by the railroads, which ought to be read by everybody. A part of the second letter, published on March 8, is given below:

Upon closer investigation it will be found that many of the charges of extortion against railroads could not stand the scrutiny of legal trial. Much of the prejudice now existing against railroad companies in the minds of the people, and even in the minds of such great men as Judge Black, is caused by a failure to investigate facts, and by irrational and illogical methods of reasoning and generalization. Without much reflection it is generally assumed that if in one single transaction out of a thousand a railroad company is guilty of making an extortionate charge, it must also be guilty in the 999 others, and if one railroad company is guilty, all the others in the country must be equally guilty. Only in this way can we account for the wholesale and unjust condemnation of railroad management, and expansion of the charges of their guilt into immense dimensions, culminating finally in asserted robberies committed by them that would have long ago, if they had really been practiced, eaten up the substance of the people and would have made us a nation of paupers, when we in reality enjoy more prosperity than probably any other people in the world. Another reason for so much prejudice against railroads arises from the fact that all charges made against railroad companies are assumed to be correct and true, and implicitly believed, and this without any previous investigation. A man thinks that some rates for transportation are too high, and men generally think they have to pay too much when they have to pay anything at all: the railroad companies are at once set down as monopolies and extortioners. Yet it is one of the most difficult and intricate questions to decide justly what constitutes a reasonable charge for transportation service, and a decision can only be reached in most cases after a careful analysis of all the elements of cost. If the millions of ignorant opinions expressed by people who absolutely know nothing about the subject are to be taken as conclusive evidence, and eyes and ears are to be shut against such facts as are reported in "Poor's Manual," it does not require a learned lawyer, but any politician or newspaper writer of the most ordinary intellect and all demagogues of every sort can make out a strong case against the railroad companies in favor of an injured people; and this is, no doubt, the reason why we see so many of these classes of people engaged in this business. But a lawyer of the great eminence of Judge Black, of his deservedly great national reputation, should not be guilty of adjudging a case upon such evidence, which comes to him "on the wings of the wind," or which he hears in corner grocery stores or in conversation with his friends. In a matter of such great importance, involving the welfare of the whole people, we must, as true friends of the people, base all our actions upon truth, and truth does not come to us upon the "wings of the wind;" in matters of so intricate a nature as those under consideration, it can only be reached by the most careful and conscientious investigation, involving an analysis of many elements and their varied combinations that influence and control results.

I make these remarks because it is on account of this loose, irrational and unjust way of dealing with this important subject that most of the difficulties of the railroad problem arise. Most of the complaints against railroads are made because the complainant has not a full knowledge of all the facts that control his case; he understands only his side of the question, and this from the standpoint of his individual and purely selfish interests. If he knew all the facts, and could or would give them a fair consideration, the cause of his complaint would be dispelled as the rising sun dispels the morning mists that obscure his view. To deal properly with the commercial, industrial and business affairs of the country we must deal with facts and not resort to guesses. The failure to observe this golden rule has led Judge Black into the great errors committed by him in his estimates, and upon the evidence of which he adjudges the railroad companies to be public enemies.

The first and greatest error committed by Judge Black is his acceptance as correct, without intelligent scrutiny, of a passage in the report of the United States Senate Committee on Transportion, of which Senator Windom was the chairman. Extracts from this report were submitted to Judge Black and to many others by the Chamber of Commerce of New York in a circular dated August, 1880, signed by the members of the Special Committee on Railroad Transportation. It is hardly possible to believe that the intelligent members of that committee could have failed to discover the gross errors contained in the extract published by them, and it is equally impossible to believe that they could have purposely spread the false information contained in it before the public, and thus intentionally mislead Judge Black and others. However this may be, it is proper here to make mention of the fact that this Transportation Committee is always so unfortunate as to pick up only such items of information, and disseminate them industriously all over the country, as have the effect of unjustly prejudicing the people against the railroad companies, while the other side of the question, which should be known to form just conclusions, is utterly ignored in their publications. In many cases the information so published is without the least foundation in truth, and this is the case with the extract just referred to, as I propose to show more in particular hereafter. It is a matter of great regret that the Chamber of Commerce of the first commercial city of this country, the great majority of whose members are so intelligent and fair-minded men, should be found engaged in such one-sided work, adding to the ignorance and prejudice of the people, when professedly the labors of the committee are to be, and should be directed towards the removal of the difficulties in the way of co-operation between the commercial and the transportation interests of the country.

The portion of the report of the United States Senate Committee referred to above, and which, with the indorsement of the Special Committee on Railroad Transportation, was submitted to Judge Black, and upon which he unfortunately based his estimates, reads as follows:

"In the matter of taxation there are to-day four men representing the four great trunk lines between Chicago and New York, who possess and who not unfrequently exercise powers which the Congress of the United States would not venture to exert. They may at any time, and for any reason satisfactory to themselves, by a single stroke of the pen, reduce the value of property in this country by hundreds of millions of dollars. An additional charge of five cents a bushel on the transportation of cereals would have been equivalent to a tax of $45,000,000 on the crop of 1873. No Congress would dare to exercise so vast a power except upon a necessity of the most imperative nature; and yet these gentlemen exercise it whenever it suits their supreme will and pleasure, without explanation or apology."

In this report two distinct statements are made which have no foundation in fact.

First. That the four trunk-line presidents have it in their power to arbitrarily and unjustly tax the people at their pleasure to the amount of millions of dollars; and, secondly, That the four trunk-line presidents could tax the people to the extent of $45,000,000 by an increase of 5 cents in the rates on grain—a power which the report says these gentlemen exercise at their supreme will and pleasure, even without apologizing for it.

I shall deal at another time with the question involving the character and extent of the power exercised by railroad companies in taxing the people, and I propose to show that no such power does or can exist, except in the imagination of men who do not know how to deal with facts. For the present I shall refer only to the estimates submitted in this report of the amount of taxes which the railroad companies are supposed to have it in their power to extort from the people.

It is stated in the Senate Committee report that an additional charge of 5 cents per bushel for the transportation of the whole crop of cereals for the year 1873 would have amounted to $45,000,000. This we will admit to be true; but when Senator Windom (who in his letter to the Anti-Monopoly League reinforces the views therein expressed) goes on to say that the four trunk lines had it in their power to enact this tax by only adding on at their pleasure 5 cents to the grain rates, he must certainly have known that the four trunk lines would never be called upon to transport over their roads the whole grain crop of the country. How could it, then, be possible for them to extort these $45,000,000? He must certainly have known that the greater portion of the grain crop of the country is consumed where it is raised; he must also have known that the grain crop of 1873 amounted to 1,531,000,000 bushels, because the estimated extortion is based upon this amount, and he certainly must have known or ought to have known that only 115,000,000 bushels of grain found their way to the seaports, Baltimore, Philadelphia, New York and Boston (because the committee was specially appointed to investigate the subject of transportation to the seaboard), and he must also have known that of the total amount carried East 49,000,000 bushels were transported by water and only 66,000,000 by rail over the four trunk lines, and it would have been easy for him to find out that 5 cents per 100 lbs. on the amount actually transported amounts only to $1,900,000 and not to $45,000,000. How could the four trunk lines have transported the whole grain crop, which weighed about 44,000,000 tons, in addition to all the other tonnage which they carried, and which, if we are to believe Judge Black's late estimates, swells the total to three times as much; in all to 132,000,000 tons, when the actual total amount of freight received by the four trunk lines from points west of their termini for transportation eastward was in 1880 only 11½ millions of tons? But even suppose the trunk lines could have carried the whole grain crop and exacted by an increase of 5 cents per 100 lbs. the $45,000,000, it is fearful to think what the total tax for moving the total crop at 40 cents per 100 lbs. would have been, and still more fearful to think what would have become of all the good people in the West, and all the animals, if the total grain crop of the country had been carried away.

It is much to be regretted that Senator Windom should have based his calculations and conclusions, and his denunciation of monopoly power, upon a supposititious case that can never happen, arriving at results that are at such great variance with the true state of affairs. Adopting methods of reasoning like these, almost anything can be proven against the railroads. If it be desired to frighten the people still more, it can even be shown, as Senator Windom did in his letter to the Anti-Monopoly League, that there is great danger that one or a few men will attempt to control, by the mere use of money, not only all the channels of commerce, but also all the channels of thought, and finally enslave the whole American people. This is, no doubt, as likely to be attempted, or to happen as that the whole grain crop of the country will be carried to the seaboard by the four trunk lines.

A gross error like the one committed by Senator Windom should have been readily detected by the members of the committee of the Chamber of Commerce and corrected before they published and indorsed it under their own signature. Judge Black is really not to blame so much in accepting their estimate as correct and adopting the same methods for his own estimates, somewhat improving upon it by multiplying the errors of Senator Windom only about twenty times, from forty-five to nine hundred millions.

In his letter of Nov. 16, 1881, to the Chamber of Commerce committee, Judge Black writes:

"But just now it is said that the railroads have agreed among themselves to raise the freight 5 cents per hundred weight, which is equal to an export tax upon the whole crop of probably seventy-five million of dollars."

It appears that while the Senate Committee sends the whole grain crop only over the four trunk lines, part of which might have been used for the feeding of the people in the Atlantic sea-board cities, Judge Black sends the whole crop altogether out of the country; at least so I understand it, from the facts that he estimates the "export tax" due to a late raise in the rate of 5 cents per 100 lbs. at $75,000,000 on the whole grain crop. Had I not promised to convince Judge Black of the errors of his estimate by pointing them out in detail I should be much tempted now to call upon all the human beings in this country and also upon the horses and the mules and the cattle and the hogs and the birds of the air and the chickens, and even the mice and the rats, to be my living witnesses in support of the fact that the railroad companies did not carry the whole year's grain crop out of the country, and that therefore they could not have robbed the people of $75,000,000 by an increase in rates of transportation from 30 to 35 cents per 100 lbs. As this proof might be considered negative and not acceptable to Judge Black, I propose to show exactly what portion of the grain crop the railroads actually did carry, and what is the exact amount of money due to an increase in the rates on grain of 5 cents per 100 lbs.

The facts are these: The whole grain crop in 1879 amounted to 2,424,000,000 bushels. I have again to use the statistics for 1879, as those for 1880 are not yet published, and call special attention to this fact so that another case of "*suppressio veri*" may not be made out against me. Those who have later information can readily make the corrections. Of the 2,424,000,000 bushels of grain raised in the United States in 1876, 261,000,000 bushels found their way to the four Atlantic ports, New York, Boston, Philadelphia and Baltimore (see reports of the New York Produce Exchange), and of these 60,000,000 bushels were carried by the canals. The remainder of 201,000,000 were carried by rail.

An additional charge of 5 cents per 100 lbs. on that portion of the grain crop carried by rail to the Atlantic coast ports mentioned, for export and domestic markets, would amount to $5,829,000 per annum. The increase of 5 cents in the rates on grain, referred to by Judge Black in his letter of Nov. 16, took effect on the 22d November last, but a reduction to the 30 cent rate will soon be made, and the higher rates will not have been in operation for more than about four months in all, so that the actual increase of the "export tax," as Judge Black calls it, even including the "domestic tax," amounts to about $2,000,000. This additional compensation collected by the railroad companies cannot justly be considered in the nature of a tax upon the people, as it does not even cover the increased cost of operation during the winter amonths. Where then is there room left for a robbery, due to the increased rates, of $75,000,000?

About 80 per cent. of the grain which arrived at the seaboard was exported in 1879; an increase of 5 cents on this portion of the grain amounts to $1,600,000, and the total earnings, from export grain carried by the railways east of Chicago, to about $11,000,000. Surely these amounts cannot be looked upon as a tax paid by the people of the United States. It is actually a sum collected by the people from the consumers of American grain in foreign countries, the railroads acting only as the collectors. Of the amounts so collected 60 per cent. is paid for working expenses of the roads to their operatives, to the wood-chopper who furnishes firewood or crossties, to the men working on the track, to the mechanics, to the engineers and trainmen, to the clerks and officers, to the manufacturers who furnish materials to rolling mills and foundries, and to the laborers these manufacturers emtloy, to the miners of coal and of ore, to the butchers, the tailors and the merchants who supply food and clothing to all these people—all get a share of the 60 per cent. of the money collected from the foreign consumer for transportation services rendered him by the railroads of this country. There is so much wealth added to the nation's, instead of a tax levied upon the people. Then the other 40 per cent. of the money collected from other countries, being about 4.8 per cent. on the capital invested, goes to the citizens of this country, who, by their capital, enterprise and public spirit have furnished to the people of the United States a great system of railroads extending into the far West, and who have made it possible by the lowest railroad transportation charges known in the world, that the farmer of Kansas and Nebraska and Iowa can compete in the markets of Europe, in the products of his labor, with the farmer that lives on the Black Sea and other grain-producing countries in Eastern Europe, thousands of miles nearer to the market. Only 40 per cent. of the total amount collected for transportation service, representing only a small interest on the capital invested, goes to those citizens of the country, fellow-citizens of Judge Black, whom he pleases to designate as robbers and public plunderers, and whom he denounces as great public enemies, whose operations must be restrained by law; while Mr. Secretary Windom believes that they will finally deprive this great country even of its liberties and prosperity.

I have shown, I believe, how unfounded Judge Black's and Senator Windom's fears are, as far as they are based upon the estimates of extortion and robbery which these gentlemen submitted to the Anti-Monopoly League, at its first meeting in February last.

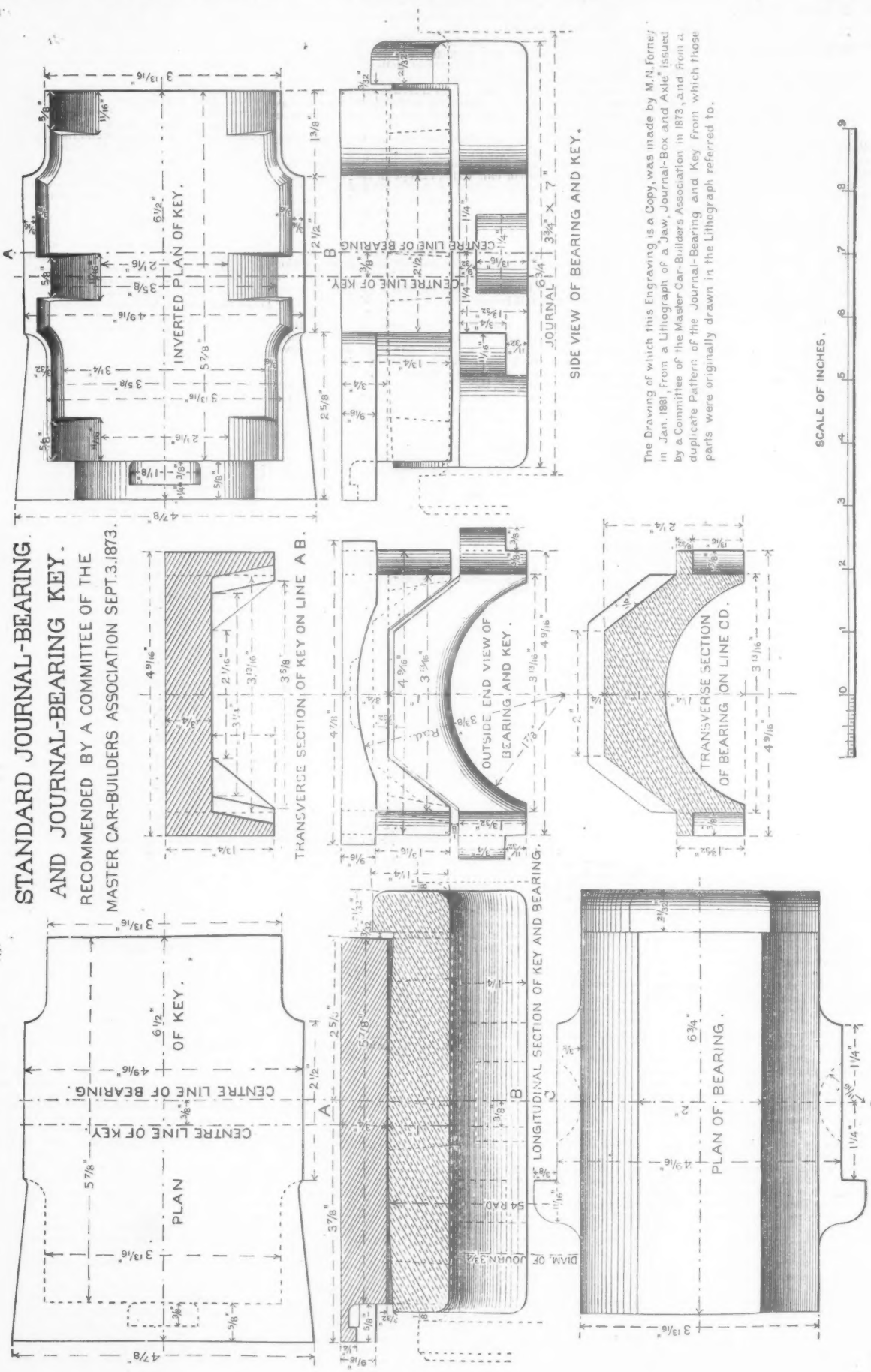
The Boston Schemes in Mexico.

The steady advance of the work on the construction of the railroads in Mexico, and of the extension of the Atchison, Topeka & Santa Fe combinations to connect with them at the railway centre of El Paso del Norte, is reported from the working parties to the headquarters in this city. The rapid development of the enterprises since their organization has been frequently remarked. It was in November last that the legal organization of the Mexican Central—organized under the general railroad act of this state—was fully recognized by the Mexican government; the subsidies and exemption from duties, as set forth in the concessions previously obtained, confirmed; and the provision secured that no subsidy shall be given to any parallel line which may be established within a zone of 25 leagues on each side of the company's lines. And since that time the construction of the trunk line has been advanced from several points; operations begun on the cross-country line from the Gulf of Mexico to the Pacific, crossing and connecting with the main line in the vicinity of Lagos, and the construction of the Sonora Railway considerably advanced. At present there are engaged on the Mexican Central about 10,000 men—surveying parties, mechanics and laborers; material is going forward, and locomotives and cars are building with the utmost despatch. Large gangs are also at work on the Atchison, Topeka & Santa Fe extension; and when El Paso del Norte is reached the working force will be put at once building therefrom along the Mexican Central line. There is also the same activity on the Sonora line. Of the subscriptions received 35 per cent. of the $5,400,000 called for under the first circular has been called in; and of the $11,430,000 under the second circular, 10 per cent. The amount raised under the first circular was set aside for the construction of the section of the road from Mexico to Leon, a distance of 262 miles; and the amounts raised under the second are to be applied to the extension to El Paso, and on the construction of the cross-country line from Tampico on the Gulf of Mexico to San Blas, Mazatlan, or some other point on the Pacific Ocean. The promptness with which all the blocks were taken up when offered has been frequently commented upon, and as soon as the subscriptions were closed they were at premium. The offer on the first subscription was for $4,250, 40 shares of the stock at par, $1,000 in income bonds, and $5,000 in first-mortgage bonds; and on the second circular, for $4,500, 40 shares of the capital stock, $5,000 in first-mortgage bonds, and $1,000 in income bonds. The blocks are now at a premium of about 18 for the first series, and 2 for the second. The company's securities are 30 year 7 per cent. bonds, $32,000 a mile secured by first mortgage on all its property and franchise; income bonds, $6,400 a mile, convertible into stock at the option of the holder, interest at 3 per cent.; and stock at par, $32,000 a mile. The grants by the much quoted concessions from the Mexican government include subsidies of $9500 for each kilometre of road constructed; exemption from all taxation, state and federal, on all the company's road and property, including stock and bonds, for the term of 50 years; exemption from import duties and all other duties in the materials necessary for the construction and operation of the road for 15 years; and the right of way through the public lands. The subsidy on the Mexican Central is to begin to be paid after the completion of the first 150 kilometres on the line from Mexico to Leon, and successively for each section of 25 kilometres. Right of way is granted to the company for the construction and operation of the railroad and telegraph lines, 70 metres in width, through the entire extent of the lines. All deposits of metals, coal, salt, marbles and other workable mineral deposits which may be uncovered

in the works and excavations made on the lines are to be the property of the companies, without prejudice to the rights of other parties, upon the condition that they shall be denounced and worked subject to the mining laws of Mexico. The authority is given to operate for 99 years, at the end of which time the line is to pass, in good condition and free of debt, to the control of the republic, the government purchas-

Sonora line traverses a rich portion of the republic, finding an outlet at the port of Guaymas, on the Gulf of California. The mineral wealth of the region through which the line passes has often been described in glowing terms. Here are the richest silver mines worked by the Spaniards for centuries. In the upper Yaqui River are extensive coal fields. Its other resources and the advantages it offers in

new life and energy brought into the country, the development, it is confidently believed, would be extensive and rapid. In addition to the cereals raised, there would undoubtedly be large ventures in the raising of cotton, sugar and tobacco for export, for which the soil and the climate offer superior advantages. Work on the Sonora line is being pushed forward with as great activity as on the other lines,


STANDARD JOURNAL-BEARING.
AND JOURNAL-BEARING KEY.
RECOMMENDED BY A COMMITTEE OF THE
MASTER CAR-BUILDERS ASSOCIATION SEPT. 3. 1873.
INVERTED PLAN OF KEY.
SIDE VIEW OF BEARING AND KEY.
CENTRE LINE OF BEARING
CENTRE LINE OF KEY.
JOURNAL 6¾" X 7"
The Drawing of which this Engraving is a Copy, was made by M.N. Forney in Jan. 1881, from a Lithograph of a Jaw, Journal-Box and Axle" issued by a Committee of the Master Car-Builders Association in 1873, and from a duplicate Pattern of the Journal-Bearing and Key from which those parts were originally drawn in the Lithograph referred to.
SCALE OF INCHES.
TRANSVERSE SECTION OF KEY ON LINE A B.
OUTSIDE END VIEW OF BEARING AND KEY.
TRANSVERSE SECTION OF BEARING ON LINE C D.
PLAN OF KEY.
PLAN
PLAN OF BEARING.
LONGITUDINAL SECTION OF KEY AND BEARING.

ing and paying for in cash the stations, warehouses, workshops, rolling stock, tools, furniture and fixtures the company may have in use for the operation of the roads. The Mexican Central connects the cities of Queretaro, Celaya, Salamanca, Iraputa, Guanajuato and Silao; it is building of standard gauge, with steel rails, and is to have first-class equipment in every respect. The Sonora road has similar grants and subsidies to the trunk and cross-country lines, and is pushed by the same interests. It has been determined in making out the line to follow the course of the Sonora River, making a rail connection in Arizona in the neighborhood of Tucson and the Tombstone district, and so become identified with the elaborate and important Central Railroad system of that region and in contemplation. The

many respects are remarkable. The land susceptible of irrigation produces two crops of cereals a year. Wheat is sown from November to January, reaped in April or early May; and at the beginning of the rainy season, the opening of July, maize is sown, which is in turn harvested in November. Of fruit there is a great abundance; the luxuriant profusion of the mulberry tree makes possible the development of a large industry in raising silk-worms, and the great excess of the female population over the males offers a large working force for the production of fruit. The climate and the growth of the grasses and shrubs upon which cattle thrive offer a promising field for stock raising, and, on the higher grounds, for fine-wool bearing sheep. With the extensive railroad system established, and

and as encouraging accounts of its progress are received.—*Boston Advertiser, March 4.*

Standard Car Journal-Bearing, Journal-Box and Pedestal.

SIR: At the last convention of the American Railway Master Mechanics' Association a committee was appointed "to confer with a similar committee of the Master Car-Builders' Association to consider the subject of a standard car journal-bearing, journal-box and pedestal, and report whether any change is desirable from the standard already recommended by that Association."

At the annual meeting of the Master Car-Builders' Association, held in June, 1880, the following resolution was adopted :

"*Resolved*, That a committee of three be appointed to investigate the present standards of what are known as the Master Car-Builders' journal-bearing, journal-box, and pedestal, and to confer with a similar committee of the Master Mechanics' Association, and report whether any changes from the present standard are desirable."

After conferring together these two committees have agreed to send out a joint circular to obtain information relating to the subject submitted to them.

On investigation they find that a committee of five was appointed in 1873 by the Master Car-Builders' Association "with power to produce a journal-box according to their own judgment, that shall be considered the standard box."

That committee had a drawing made of a car-axle journal-bearing, journal-box and pedestal. The drawing was lithographed and copies were extensively distributed. On examination of this lithograph it is found that the journal-bearing and its key are somewhat imperfectly shown, and if the lithograph was given to different pattern-makers it is extremely doubtful whether the patterns of these parts made from it would be alike. The committee have also learned, from different sources, that journal-bearings and keys which are said to be of the standard form and size are often not alike, and that in some cases the bearings of one road will not enter the boxes of another. They have, therefore, had a new and more complete drawing of the journal-bearing and key made from the lithograph referred to and from a duplicate of the original pattern from which the lithograph was made. This drawing has been made with great care, and is believed to be as nearly like what the original standard was intended to be as it is now possible to make a drawing. It has been engraved half size, and a print of the engraving is sent herewith. To enable the committees to report intelligently on this subject they request that you will give them the following information :

1. If you use the Master Car-Builders' standard journal-bearing and key, will you please compare those you use with the engraving, and if the sizes of yours differ from the dimensions given, please erase them on the engraving, and substitute on it the sizes of the castings which you use, and return the engraving to the committees. Also state to the committees any differences in form, if any exist.

2. Would you recommend any changes in the form or size for a journal-bearing and key from those represented by the engraving, or would you prefer a journal-bearing without a key ? and give your reasons for such changes as you propose.

3. If you would recommend a journal-bearing and key of different form and dimensions from the standard, please send an accurate full-size drawing of them to the committees, or if that is not convenient, send one of the bearings and one of the keys which you would recommend. Before you send them have them distinctly and permanently marked with the name or initials of your road.

4. In order to enable the committees to report to what extent the Master Car-Builders' standard axle has been adopted, please state whether it is used on the cars or tenders belonging to your road, and approximately the number now in use.

Answers to the above circular should be sent to M. N. Forney, No. 73 Broadway, New York, and, as a meeting of the two committees must be held in April, it is earnestly requested that the replies be sent in before April 1.

Very respectfully,

M. N. FORNEY, JAS. SEDGLEY, JAS. M. BOON, H. L. COOPER, W. S. HUDSON, } Committee of the American Railway Master Mechanics' Association.

F. D. ADAMS, JOHN KIRBY, S. A. DAVIS, } Committee of the Master Car-Builders' Association.

Rail Patterns.

BY A. L. HOLLEY.

[Paper read before the American Institute of Mining Engineers, at the Philadelphia Meeting, February, 1881.]

There are regularly manufactured in the eleven Bessemer steel rail mills of the United States 119 patterns of steel rails, of 27 different weights per yard.* This list does not include patterns which, although still largely in use, are regarded by experts as obsolete, and which would swell the number to nearly 300 ; nor does it include all the patterns for which rolls are kept on hand to fill a possible demand ; nor does it include patterns rolled in one finishing groove by opening or closing the rolls, so as to get different weights with the same contours. The list embraces only those separate patterns which are subject to current orders.

How thoroughly modern these patterns are is shown by the fact that of the whole 119 there are but five patterns of conspicuously bad shape; all the rest more or less completely illustrate the standard features—a heavy head, light web and flanges, and a good angle to hold the fish-plate. Sixty-two per cent. of the patterns have the "Chanute" head, which was not designed until 1874;† 64 per cent. of the 119 patterns are embraced under five weights per yard; three only of these vary from standard type; there are thus left 76 patterns, all of them modern and standard, to represent five different weights, for which five patterns would perfectly answer. Of the 60-lb. rails, there is only one of the pear-head type, while a dozen of the beveled head templets cannot be distinguished from each other except by laying them together, and yet no less than 30 patterns are in current use for the 60-lb. weight, which is obviously 29 patterns too many. Table 1 gives particulars of the 119 standard patterns.

The object of the paper is, first, to show that while this multiplication of rail patterns is an annoyance and expense to rail makers, it is a source of immense loss to railway companies; second, to review the suggestions of experiment and practice regarding the shape of steel rails, and to suggest a method for the adoption of the few standard patterns which are necessary.

First. The cost of a set of three high-finishing rolls for steel rails, with guides and guards fitted, averages about $1,500. The number of sets of rolls in use at the eleven mills to produce the 119 patterns—several mills making the same patterns—is 188, and their cost was about $282,000, or nearly 19 times as much as it would have been for the maximum requirement of ten patterns. But this does not give an adequate idea of the expense of multiplying patterns. New sections are constantly brought out by railway companies, and as most of the 119 are recent, it is safe to suppose that this process of multiplication would naturally go on. Again, each of the mills roll many of the same patterns, sometimes for the same roads. It is not probable that all the mills will be called on to roll all the patterns, but it is not improbable, if this system continues, that each mill will be called on to roll a large number of them. One of the mills already rolls 29, another 25, and three of them roll 21 each of the 119 modern patterns. If the mills average even 30 patterns each, the 330 sets of rolls required will have cost half a million of money.

The cost of changing rolls is a much more serious expense than the cost of rolls. The time of changing rolls varies in different mills, but it probably averages about 2½ hours, or the time required to roll, say 35 tons of rails. The number of changes made also varies very much. Rolls that do a fair week's work, say 2,000 tons, without dressing, may be replaced by rolls of another pattern, on Sunday, without loss of time ; but the great majority of orders are not for 2,000 tons ; they are more often for 500 tons, and sometimes for 100 tons. One mill had to change rolls as many as four times a week, for some months, and I presume this is not an unusual experience. Were each of the eleven mills obliged to change rolls and patterns only once during the week, not including Sunday changes, they would together lose, at the reasonable profit of $5 per ton on rails, and allowing the usual stoppages for repairs, above $90,000 per year.

The looking after and keeping up of so many patterns of rolls, and the innumerable varieties of drilling and slotting, involve extra men and expense; but they are chiefly deprecated by rail-makers as an annoyance, rather than as a direct expense. With all the care that must be taken in large organizations, mistakes and misunderstandings about them will constantly arise between makers and users, when each customer wants a different rail, different variations in standard lengths, different percentages of short rails, different sized fish-holes, different pitch of fish-holes, different patterns of fish-plates, different lengths of fish-plates, different slotting, different bolts, different tests, different everything.

Second. The cost to railway companies of multiplying patterns is far more serious, chiefly in one direction—it prevents rail-makers from keeping standard rails in stock. If rail-makers could roll and stock standard patterns, when special orders were slack they could prevent the excessive rise in prices which the scarcity of rails from time to time creates. It cannot be denied, after the unvarying experiences, that many railway managers do not buy largely when rails are cheap; they put off and put off ordering their full supplies, hoping for lower rates, until the necessities of the track can be postponed no longer. Just at this time a hundred other roads are in the same condition—they are all pinched together—and off they all rush to the rail mills to get first served, and up go the prices of rails, $40 or $50 per ton.

The difference between the average minimum and the average maximum prices of rails on the books of one steel company was $43.50 per ton in nine months. It is probable that 200,000 tons of rails could have been added to the product of the eleven Bessemer steel mills during the year prior to the rapid rise in prices. When the railroad companies did buy the 200,000 tons, they paid an advance of $30 to $40 per ton. If these rails had been in stock when the demand came, the simultaneous wants of a large number of roads could have been met without much increasing the price. Supposing the price to have been only $10 less than the average high rates, the saving to railway companies would have realized the respectable sum of $2,000,000, and the rail-makers would have been better off too, because they would have got fair prices for their whole product. High prices at one end of the year did not compensate for the excessively low prices at the other end, because when rails were dear pig-iron and labor were equally dear.

The argument is not that stocking standard rails will always make them cheap. Their value, like that of all products, changes with the general condition of trade. Rail-makers would rather produce, even without profit, for a few months in the year, than to lose their good men and break up their smooth working organizations. Stocking standard rails would enable them both to produce cheaply and to sell at a fair price; it would therefore check excessive fall as well as excessive rise in prices.

The argument is: *First.* That running mills on half or three-quarters time, or letting them stand for one year and the next year filling them with orders for short delivery far in excess of their capacity, is simply a waste that railway companies have to pay for in the long run. No fact regarding the iron manufacture is better established than this—that regularity in working and gradual increase of capacity, rather than sudden fluctuations, are to the advantage of all concerned. Running a 100,000-ton mill at a 70,000-ton rate does not create nor save any money, however much it may temporarily bring down prices. On the contrary, it wastes the time of the men, it wastes fuel, it wastes machinery, it wastes capital; and for all this waste, neither the railway nor the steel-maker nor the workman nor anybody has saved anything or got anything more to show than they would have got out of a fire or an earthquake.

Second. Excessive production is also wasteful; it strains both men and plant, and it does not allow time for repairs just when they are needed. The wear and tear of loose joints and connections in machinery increases, not uniformly, but at least as the square of the time they are allowed to run without repairs.

The same rule holds in the preliminary industries of making pig and mining ore. Excessive output is wasteful, and a large decrease of output, either by working short turns or by standing, is particularly wasteful of the time of men and the use of the plant. All the men and all the plant must be used, and in so far as they are not fully used, their capacity is simply wasted.

For all this, railway companies have to pay in the long run. Any temporary cheapness of rails must be compensated. They cannot and will not be produced, for long periods, without a fair profit, nor is it to the interest of a railway or of a community that any industry should be prosecuted without fair profits.

Third. Besides the waste due to these fluctuations of output, railway companies have to pay for maintaining a system by which they cannot get rails when they want them. Of course, rail-makers will work first for those who pay most, and high rates for immediate accommodation fix the general price for months to come.

Rail-makers would gladly stock standard rails, just as wheel-makers stock standard wheels, if they could be sure that the rails were standard and could be sold just as readily as those made to special order. As we have observed, this would save them trouble and anxiety as well as loss, and it would enable them to keep their organizations and plants in economical working order, so as to produce at the minimum cost.

There is still another consideration. On account of the sudden scramble for rails, due largely to there being no stock to draw from, 150,000 tons or more per year have to be imported at the then ruling high prices. American rail-makers would have gladly made these rails during slack times: as it is, American mill-owners and American workmen have now lost them altogether, and the railway companies have paid extravagant prices.

Fourth. The question now arises, How is the difficulty to be remedied ? The answer involves a review of the causes:

1. The early steel rails were naturally made to the existing iron patterns. These were generally pear-headed, in order to prevent the sides of the head from breaking down, and were therefore not adapted to fishing. When the quite different physical character and behavior of steel became known—first of the hard steels and then of the modern rail steels—many and necessarily diverse attempts were made to adapt the shape of the rail to the new and varying material. Some of the attempts were scientific, and their general results were similar, but the exact patterns largely differed. On the contrary, some railway companies utterly disregarding the accumulating knowledge of steel, stuck to the old pear-head; and as grooves for rolling iron have too much draft for steel, new rolls had to be made for old patterns, thus still further aggravating the difficulty. Finally, in 1874, Mr. Chanute, of the Erie road, started a really scientific investigation to determine the shape and proportion for steel rails. This we will consider further on.

2. There is another cause of the multiplication of patterns more potent and more difficult to remedy than any intrinsic cause. It is the egotism of certain engineers and officers of railways. I do not refer to those honestly differing opinions which are founded on observation, even if that observation is incomplete and one-sided. I refer to the determination of certain persons who dictate patterns to railways—and these persons are not a few—to use no pattern that any other manager has invented, but to vary from all standard patterns, for no reason whatever except to inflict their own individuality upon some feature of the interest confided to their care. I cannot, of course, give names and particulars in a public paper, but there are plenty of names and instances known to rail-makers and to dealers and to the railway fraternity. There are instances of men signalizing their accession to power by the imposition of a rail pattern which is not only new, but inferior in every way to patterns in current use. Some of these tinkers think they win the admiration of boards of directors by thus showing up the general ignorance and their own technical genius. They fondly believe that having "Stiggins' rail pattern" talked over in the mills and railroad offices gives them a certain immortality. It does.

3. There is another cause of multiform rails, which is just as absurd as the last named. I give a typical instance —a case in which, I am sorry to say, I personally figured, for I had to design the rail for a steel-making client. A railway manager wanted a better head on his otherwise fair rail, but he insisted that it must fit his standard fish-plate. No standard rail would fit his fish-plate, although several suited him in other respects. Nothing would do but a bran new pattern, and it is now one of the 119. This railway company is to be congratulated. It will have saved, during the period of a dozen years, perhaps a hundred dollars' worth of special joint fastenings at each end of long sections of replaced track, and where an occasional bad rail is replaced before the general renewal.

The following practical questions are first in order : What are the proper proportions for steel rails ? How were they determined? Who is the authority? The art is now so far advanced that we can answer these questions. The proportions and even the contours are those adopted in 62 per cent. of the 119 standard patterns; they were determined by experiment and practice; and the authority is the majority of railway managers and all the scientific experts. These proportions and contours are illustrated by the 10 patterns shown by the engravings.*

It must be constantly borne in mind that the experience in iron rails is no criterion for steel, because modern rail steel, including the soft steel made on Dr. Dudley's formula, is a comparatively uniform product, varying less than other large classes, such as tool steel and even boiler-plate steel. Rail irons, on the contrary, especially those just preceding the steel era, could not be classed under one species, if indeed they were of the same genus. They included every possible mixture of metalloids, slag and iron, from the rotten conglomerate that crushed under a light traffic when piled into the 84-lb. 4-inch rail made for the Buffalo, Corning & New York Railroad, prior to 1858, to the old Reading 45-lb. rail,† made of re-worked merchant bar, and nearly as homogeneous and durable as steel. It is not surprising that iron rail patterns were various, when nearly every lot purchased had its particular manner of going to pieces. One railroad superintendent could guess as well as another at a pattern that wouldn't stand; scientific inquiry had not got around to the rail business.

Let us examine the steel rail pattern in detail:

1. A few years' use of steel abundantly proved that the sides of the head do not break down, even if quite thin. The only normal mechanical destruction is the wearing out. The occasional mashing of the ends, and the very rare splitting and crushing of the rail elsewhere, is due to the bad casting of ingots, and to working spongy ingot tops into rails. The breaking of rails which are properly laid is due to chemical defects. The strength of steel thus rendered it practicable to cut out the under side of the head, leaving a nearly flat table to hold a fish-plate, and so to sustain and preserve the ends of the rail.

2. The next point was to decrease the normal destruction by wear. Breaking down did not occur, and lamination could not occur in the product of a fusion process. The first and very obvious suggestion was to put as much metal as possible into the head, without robbing the web and flange and impairing the rail as a beam. These points will be considered further on.

Having as much metal as possible in the head, what proportions and shape endure best, reference also being had to the wear of the rolling stock ? A wide head theoretically reduces the pressure per square inch of the wheels. But on account of the slight coning of the wheels, it has been observed that their actual foot-prints are only three-quarters to one inch wide, while those wheel-treads which are worn hollow do not take a full bearing on a wide head. If the head is wide, it must be thin, with a given weight of rail, so that its side presents less surface and hence a higher rate of flange wear, and a greater variation in the gauge of the track. The head must be wide enough to give ample bearing to the fish-plates, otherwise they are soon worn to such shape that they cannot be kept tight. Exactly the best width of head for a given weight of rail can hardly be determined, but the experience of a decade has convinced experts, generally, that for 56 to 70 lb.-rails it lies between 2¼ and 2½ in. Rail designers have, therefore, respectively adopted every possible fraction of this undetermined quarter of an inch.

The exact contour of the head is very important. In 1874 Mr. Chanute, Chief Engineer and Assistant General Superintendent of the New York, Lake Erie & Western, then the Erie Railway, observed that rail heads rounded to a small radius wore the wheels out of their normal shape at the junction of the flange and the thread into a more nearly right-angular shape, which was obviously less strong and less safe. This is illustrated by the wheel section, fig. 2. It was also obvious to him, as it is now to everybody, that the greatest wearing surface, and hence the least rate of wear, would be secured by giving the side of the head such a shape originally as the wheel would give it by wear. Mr. Chanute then made a large number of templets of worn rails and of worn tires and wheels. Fig. 1 shows the section of a

* From all the works 188 patterns were sent to me as standard. Of these I found 119 different shapes and 69 duplicates.

† Since this paper was read I have seen at the Bethlehem Iron Works the templet of a 68 lb. Lehigh Valley rail with the beveled head, usually called the "Chanute" head, and marked "Templet of 1872." I learn that iron rails with beveled heads were rolled at Bethlehem prior to 1870. A. L. H.

† See Colburn & Holley's "European Railways, plates 12 and 15½.

* See folded plate.

new wheel, and figs. 2 and 3 show the extremely differing forms after wear. Figs. 4, 5 and 6 illustrate the locomotive tires in the same way; the angle is more open than in the case of wheels, because the lateral play of tires is greater. From all these templets Mr. Chanute took a mean line, which he adopted as the shape of the head.* Another advantage of this shape is that, with a given weight of metal, it widens the fish-plate bearing. As we have observed, the beveled head has been generally adopted, although with slightly varging angles, of course, for 62 per cent. of the 119 standard rails.

3. The width and shape of the head having been provided for, how much metal can be spared from the web and flange to deepen it, and how shall the remaining metal be disposed? The rail is now to be considered as a beam, and as a bearing to transfer the vertical and lateral strains to the sleepers. It is obviously impossible to determine the exact proportions which are better than any others, because the conditions of use vary almost infinitely; but so nearly the best form for

FIG. 1.

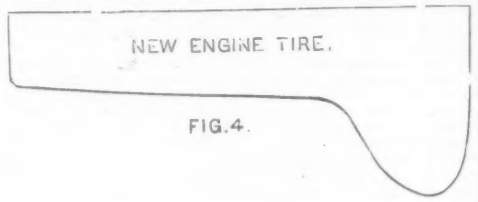


FIG. 4.

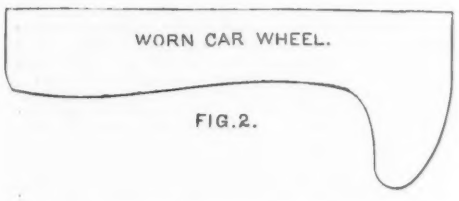


FIG. 2.

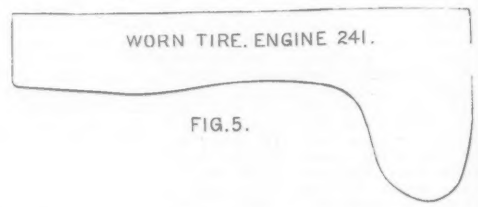


FIG. 5.

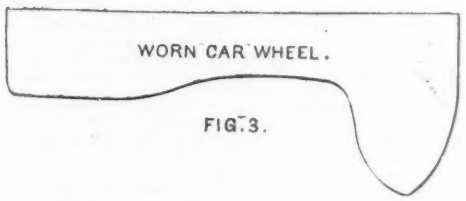


FIG. 3.

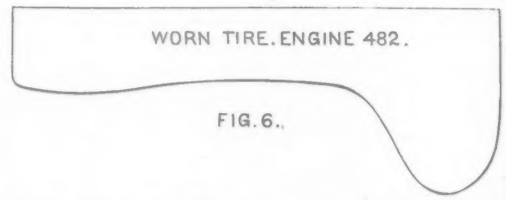


FIG. 6.

average use has been determined by practice, that no one can prove it not to be the best.

(I.) The web and base of the rail have been pared down to meet the conditions of the beam, until further reduction would impair their safety. It fell to me to point out, in a discussion of this subject before the Society of Civil Engineers, that permanent rupturing strains would be left in a rail of which the flange was so thin that it came out of the finishing groove at a little higher temperature than "black hot," while its heavy head finished at a bright red. Engineers generally who were starting on excessively thin flanges thickened them to meet this circumstance of manufacture. The minimum thickness of the edge of the flange for rails above 56 lbs. is ¼ inch; the thickness of the flange where it joins the stem is from ⅝ to ¾ in., or that which will give an angle for the fish-plate of about 12°. The reason of this will be further considered.

The width of base must be so great that the rail will not turn over and will not cut into the sleepers. Mr. Sandberg's rule for sleepers, 3 ft. apart centres, is to make the width and height the same, except that in the lighter sections the proportion of height is increased. In the best American practice, with sleepers 2 ft. apart centres, the base and height of rails are usually the same. A 4-in. base with 4⅛-in. height is the largest deviation from this rule. The 6⅝-in. base of the 4⅛-in. rail of the Metropolitan Railway in London is a singular departure in the other direction.

(II.) The web of the steel rail has been pared down until it runs in the twenty-two 56-lb. patterns, from 13 to 20 thirty-seconds, and in the thirty 60-lb. patterns, from 7 to 10 sixteenths of an inch. But no web of any of the current patterns has broken down from being too thin. Whether or not a 64th should be added or removed, no man can say; nor is the question of further variation of any importance, except to the immortals before mentioned.

(III.) The foregoing proportions having been settled, the question is, How much of the remaining metal shall go into the height of web, and how much into thickness of head? To perfect the rail as a beam, so much of it should go into the web as to at least double the standard height, because the stiffness of the beam increases as the cube of the height. But it has been ascertained that with the best existing type of road-bed, 5½-in. rails wore out more rapidly than 4-in. rails of the same quality. The reason is obvious: the higher rails were too rigid; the lower rails yielded slightly under the load. Dr. Dudley graphically describes wear as the breaking or mashing of the infinitesimal teeth which form the surface of the rail. We may regard the wheel as a projectile which breaks and smashes these teeth. Its destructive effect is as the square of its velocity; the elasticity of the rail increases the time of impact and so decreases the power of the blow.

As the tread of the rail becomes a more and more perfect plane by means of better manufacture and road-bed, the stiffness of the rail may be increased, and no doubt will be increased to carry heavier loads per wheel. With good ballast of the present type, and sleepers 2 ft. apart centres, it has been found that a well proportioned rail of about 4½ in. in height will carry the present loads of 5 or 6 tons per driving wheel, to the best advantage. The Great Western U rail, still used, is the worst form for stiffness.

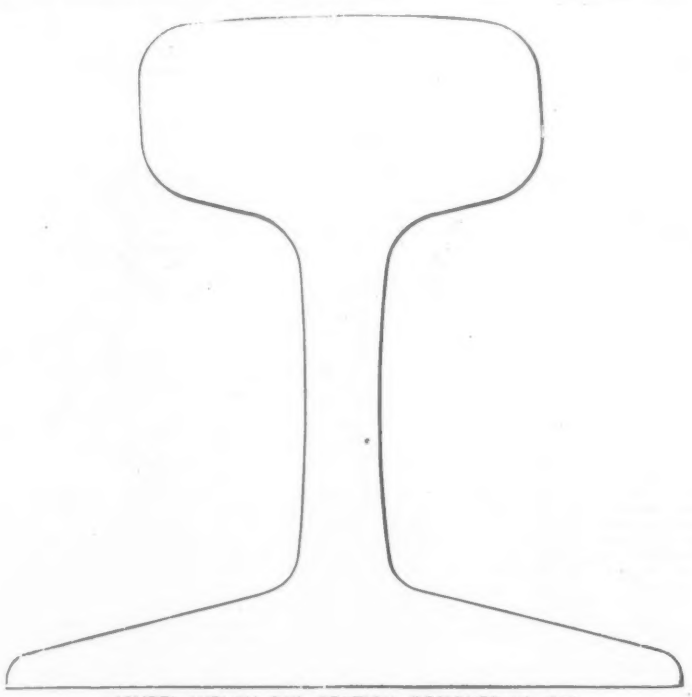
The rule for spacing sleepers in a country where they are comparatively cheap is to leave just as little space between them as will allow the convenient tamping of ballast. There is great convenience in the even number, 2 feet, and it cannot be proved that it is not as good as 2 feet and a quarter of an inch, which some rail tinker would no doubt have specified, if it had occurred to him.

Iron and steel sleepers, so largely used in Germany and elsewhere, and especially the longitudinal system, will no doubt modify our permanent way, in all departments, at a not distant day, but we shall have time to enjoy any improvement of our present system.

Having thus determined all the proportions except the thickness of the head, we find that rails of 60 to 72 lbs. per yard may have heads of 1¼ to 1⅜ in. mean thickness (see Table I.),* which will last, under average traffic, until new conditions of road-bed, load and manufacture shall have indicated further improvements in the weight and proportions of steel rails. It probably would not pay, considering the interest account and probable improvements, to secure longer wearing capacity, except in rails for specially severe service.

(IV.) What determines the angle of the under side of the head, to hold the fish-plate? If the plate could bear against horizontal surfaces, it would not be forced out laterally by the load; but it could not be properly fitted by rolling, its play would rapidly increase and could not be taken up. Mr. Chanute experimented in this direction, also, and found that with angles above 15° the plate was loosened by the stretching of the bolts; this relieved the pressure and friction of the plate against the nuts, and allowed them to turn. He therefore adopted the angle of 15° under the head. To avoid unnecessary metal in the flange, he made its angle 12°. With the angle fish-plate, which can hardly be put on wrong side up, the difference in the top and bottom slopes can do no harm. Mr. Sandberg specifies 11° at both top and bottom, for heavy rails, and 15° for light rails.†

Speaking of the angle fish-plate, while recent inventors of this excellent device are disputing about their priority, I call your attention to an engraving (plate 14⅛) in Colburn & Holley's "European Railways," published in 1858, and entitled "58-lb. rail with Adams' bracket joint." This form of fish-plate was invented by the late Wm. Brydges Adams of London about 30 years ago. It was first introduced here, and greatly improved in form by the Bethlehem Iron Company. I also venture to remark that I designed the rail shown with it, 24 years ago. It rather differs from the patterns current at the time. It was intended to be made of the best, reheated, soft iron, which with thin and hence elastic heads had been proved to break down least and to wear best. The flange was made a little thick, so that it could be rolled out of tough, red-short iron.


ASHBEL WELCH RAIL SECTION, DESIGNED IN 1866.

Fifth. Having thus observed that the proportions and contours of the majority of the standard patterns were determined by scientific methods, and that no new departure is necessary in the present state of the art, we are confronted with the final question: How are 60 or 70 patterns of rails, all of them illustrating the established principles, to be reduced to the few patterns, which by universal adoption, each for its own character of service, will enable the great economies we have considered to be realized. The reform is certainly not to begin by making a new set of patterns. Better road-beds, steel-sleepers, heavier wheel-loads, and improved adaptations of steel will determine new patterns in due time.

For the present needs of all concerned, the obviously reasonable and the only practicable solution is for railway companies to fix on the say 10 patterns, each of different weight, from about 30 to 70 lbs., which most completely embody the settled principles of steel-rail proportions, with reference also to the extent to which such patterns have already been adopted. For instance, it would not be reasonable to ask the many companies who have adopted the most used and good 60-lb. pattern shown by the engraving, to inaugurate reform by changing to a better pattern. No railway company which has a good pattern likes to change; each insists that it has as much right as another to perpetuate its own pattern. In so far as railway managers treat the subject on these narrow grounds, no reform can come.

Guided by the principles we have considered, I venture to suggest the 10 patterns shown in the engravings, and selected out of the 119 current patterns, as standards for steel rails. I have thought it best not to complicate the matter by stating who designed these rails, or who rolls them or who uses them. These facts can be found out by those who need them. The only important facts are that these patterns, on the average, embody more nearly the established principles, and are more largely used than any other set of 10 modern patterns.

No expert whom I have consulted in the matter thinks 10 patterns too few; some say that the 67 lbs. between the 60 and the 72 lbs. is enough, and that the 63 and 65 are unnecessary. The 63 and 65 are, however, largely used, and I am sure that steel-makers will not object to stocking rails of 10 patterns, as far as may be necessary, if railway companies will only agree on them.

To start the reform: If a considerable number of companies who use say a 57 to 61-lb. rail, or whose traffic a 60-lb. rail would suit, would agree on a good 60-lb. pattern which is most used—if they would only agree to adopt it say for two years' orders—rail-makers could and would gradually begin stocking this standard rail when orders were slack, in the certainty of selling it at a fair price when any of these roads might want rails. Rail-makers would take the risk of changes, as under such a system changes would be made, not by capricious individuals, but by a convention of experts; and they would be foreshadowed by discussion and consultation. The system once inaugurated would be tested; attention would be drawn to its advantages, and it would inevitably become general.

The cost and trouble of changing the pattern of steel rails is not so very formidable, when closely considered, in view of one fact: steel rails wear so uniformly, under similar conditions, that long sections of track can be renewed at a time, thus requiring but few special fastenings where the pattern changes. With iron rails, especially those bought at the lowest price, the difficulty would be very largely increased.

Sixth. It may be said that uniformity in patterns is just as necessary for iron rails, which are still largely used and to be used. If the best iron rails are used, there would be little difficulty in determining standard patterns; but the best iron rails will cost more than steel rails. I do not feel equal to the consideration of those varieties of iron rails which are laid by speculators, just to get a road running and its securities unloaded.

Seventh. Rail fastenings would also have to be uniform, to a certain extent, for each pattern. Rail-makers could not stock unfinished rails and then get them all back into the mill for drilling and slotting, thus interrupting current work. Fish-plates of all types may be used, so long as their bearings fit the standard rail.

The foregoing considerations about uniform rail patterns apply equally to fish-plates, and need not be repeated. The present diversity of patterns is perfectly unnecessary and wasteful.

It should at least appear that the size and pitch of fish-bolt holes might be agreed upon, and yet they differ to a degree which is ridiculous. In 21 patterns of rails made at one mill, there are 6 different diameters of hole (from ¾ to 1 1-16 in.); there are 10 different distances apart of holes (from 4 to 6 in.); and there are 14 different distances of the first hole from the end of the rail (2½ to 3 15-16 in.); for one pattern the distance is 2 13-64 in. To think that the mind of man can hit perfection in fish-bolt spacing within the 64th of an inch is almost appalling.

It would be impossible within the limits of this paper, which I fear is already wearisome, to fully discuss rail fastenings. It should be obvious to everyone that the angle plate has every advantage over the plain splice, as a means of holding up the rail vertically and laterally, and especially as a means of preventing the creeping of rails without starting fractures in them by nicking their flanges

*See a foregoing note regarding an earlier use of a similar head.

*Table II. gives particulars and capacity of Sandberg's sections. These tables are omitted here.

†Table III. gives particulars of Sandberg's rail fastenings.

Table III. gives Mr. Sandberg's specifications for fish plates and bolts. It seems proper in this connection to recognize Mr. Sandberg's important contributions to good permanent way, during the last 20 years, by means of careful experiment and observation, and by means of a system of inspection which in its theory and in its difficult administration is fair to both the makers and the users of rails.

In conclusion, let us very briefly review the ground we have traversed:

No expert will deny, I think, that about 10 weights of rail will just as perfectly meet the requirements of railways as the 27 weights which are now standard; and that some one pattern of any given weight is better that many patterns—for instance, than the 29 other standard 60-lb. patterns.

The multiplication of patterns is a source of expense and trouble to rail-makers, in getting up new rolls and in delays while changing rolls. But it is a source of far greater expense to railway companies, chiefly by preventing the stocking of standard rails, which would check fluctuations in prices and prevent excessive prices. Fluctuation in output also wastes capital, plant and time, for all of which railway companies must pay in the long run.

There are two principal causes of the multiplication of rail patterns. The first was the natural result of adopting for steel the patterns of iron rails which provided for every variety of defectiveness peculiar to iron, and of adapting patterns to the various grades of steel, until a standard grade was determined. The other cause is the unreasonable egotism and the narrow and trifling considerations of certain railway officials.

Other railway officers, however, have in a scientific manner determined the proper proportions and contours for steel rails, and they have determined exact patterns which are so nearly correct that they cannot be proved to be incorrect. The majority of railway companies have adopted the proportions and contours, but the patterns are still very numerous.

The obvious way to reduce the existing many to the few necessary patterns is to adopt for each of the necessary weights that existing pattern which most nearly conforms to the principles which have been established, and with reference also to the extent of its present use. The patterns shown in the engravings are proposed as possibly the best that can be selected.

Rail fastenings must be uniform to a certain extent, but this reformation does not present serious difficulties.

Meanwhile, improved road-bed, heavier wheel weights and new adaptations of steel will provide the elements for improved rail patterns, and these will be devised in a scientific manner by that class of railway managers which has so largely improved the forms of steel rails.

The Origin of the Modern Steel Rail Section.

During the discussion on steel rails at the meeting of the Institute of Mining Engineers, Feb. 18, the following letter from Mr. Ashbel Welch to the Secretary of the Institute was read. It was dated Philadelphia, Feb. 17:

DEAR SIR: I was this morning an interested listener to the remarks of Mr. Ashbel Welch in regard to his designing a new section for steel rails, in 1866, and for the sake of the truth of history and in order to give the credit to an American, and where it rightfully belongs, of designing the first section for steel rails which was intelligently adapted to that material, I beg to state the following facts:

On the 14th of August, 1866, Mr. Ashbel Welch gave me an order for 200 tons of steel rails to be made for the Camden & Amboy Railroad from the section designed by him. A copy of this section I append herewith. Messrs. John Brown & Co., of Sheffield, for whom we were then agents, at first declined to roll these rails, owing to the thinness of the flange, but subsequently accepted this order. In principle, as I think you will see from the section, this pattern was similar to what are now known as the Sandberg section, having a large amount of metal in the head, and without superfluous weight in the stem and base. His section was put upon our book, with a title "Ashbel Welch section," and this name was also rolled upon the stem of the rails. We sold afterward large quantities of these rails under this title to the Philadelphia & Baltimore Railroad Company, as well as to the Camden & Amboy Railroad Company.

I make this statement in justice to Mr. Welch, who ought to have the credit of designing a section which had much to do with making steel rails a success. At the time Mr. Welch designed this section it was quite a new departure, as our old section books show it was very different from any of the sections which, up to that time, had been ordered by any of the railroad companies.

I should be very glad if this fact can be recorded upon the minutes of the Institute, and remain,

Yours very truly, WM. R. HART.

Mr. Vanderbilt's Opinions.

A reporter for the New York *Herald* recently made a four-column article on an interview with Mr. Wm. H. Vanderbilt; but as Mr. Vanderbilt confined himself to answering the reporter's questions, and these questions were about horses, the World's Fair, the value of riches and the like, as well as about railroad matters, the amount of valuable railroad information conveyed in the long article is not alarming, though some sound and acute judgments are expressed. The article is further enlarged by the reporter's own remarks, like the following on Mr. Vanderbilt's personal appearance:

"I have been ill at home for the last three weeks, said Mr. W. H. Vanderbilt on Saturday afternoon, 'but I shall gladly answer any questions the *Herald* may like to ask me.' Mr. Vanderbilt, as he said this, stretched out his legs comfortably in a large, old-fashioned armchair in his library, which overlooks Fifth avenue and Fortieth street. Simple as the man are all his surroundings. The furniture though elegant and tasteful, has nothing of that gaudiness which might be seen in the residence of men far less wealthy. Everything is suggestive of ease, comfort, simplicity and utter absence of pretension. The only striking indications of immense wealth are the master works of Gérome, Meissonier, Knaus, Diaz and other great painters, which fill every available inch of space in the walls. From the great, spacious windows an admirable view of the life and bustle of Fifth avenue on a fine afternoon may be obtained, and leaning back in that great armchair in the easiest of attitudes Mr. Vanderbilt chatted pleasantly away, giving a quick, ready reply or repartee, as the case might be, to every query or suggestion of his interlocutor. No one could help noticing the neat plainness of his attire. Those little white ivory studs in his shirt bosom would have made many a dainty and spruce dry goods clerk blush for shame. Mr. Vanderbilt is one of the readiest and most fluent of talkers, as he is one of the most modest and unassuming. His large, massive head, with that wide, high, powerful brow; his clear, penetrating, gray-blue eyes, full of worldly wisdom and shrewdness; his strongly marked, full nose and mouth, characteristic of decision and firmness, and his squarely set, resolute chin, are all indicative of a certain rugged force and strength, tempered by an air of supreme repose and contentment which would strike the most superficial observer who might not be aware that he was in the presence of W. H. Vanderbilt. There is a manly ring in his resonant voice; he speaks like a man who believes every word he says, and in humorous sallies his eyes light up in the most striking manner, while the very faintest shade of a smile plays round his lips in a manner of quiet, subdued irony quite his own. In certain passages of the interview about to be presented the reader will find it easy to imagine the delicate play of this ironical smile, even where it is not expressly recorded, particularly when Mr. Vanderbilt speaks of the demagogues assailing the railroad interests and the Wall street 'sharks,' who, to use his expressive, vigorous words, could walk round him three or four times in the morning before breakfast in the game of stocks."

Other extracts from the report of the interview are as follows:

CONSOLIDATING RAILROADS.

"And as to the great railroad consolidations, which have been regarded by so many as a menace to the welfare of the people."

"I am perfectly convinced that consolidations are beneficial, not only to the properties consolidated, but to the public at large. In my entire experience in railroading I know of no instance to the contrary. The New York Central & Hudson River Railroad is a conspicuous example of this. The old New York Central served the public much better after the several links composing it were formed into one road, and since its consolidation with the Hudson River it furnished better service at about one-half the cost to the public. The same may be said of the Lake Shore, of the Pennsylvania system, and, in fact of all the consolidated lines. Transportation over the great trunk lines has been cheapened by a much greater percentage within the last ten years than the price of the products and manufactures carried by them have been reduced. I must say, however, that while I am in favor of consolidating continuous and connecting lines which can be operated more cheaply and more efficiently together than independently, I am not in favor of consolidating competing parallel roads.

THE ANTI-MONOPOLY MOVEMENT.

"You probably have observed the present anti-monopoly movement?"

"It is perfectly absurd—this cry of anti-monopoly. Agitators and demagogues always begin by attacking property; they know they cannot succeed unless they get up a popular cry which presents a false issue. The present mode of attack is to call all the great corporations monopolies, and the railroads are selected as the chief offenders. Now, as a matter of fact (and here Mr. Vanderbilt's voice grew almost vehement in its earnestness), the railroads have done more than all other agencies to develop the country; a larger percentage of the money invested in them has been sunk than in any other business, the capitalist who first embarked in the enterprise generally losing his money and the people getting the roads. Moreover, consider that never in the history of the country has there been so much railroad building in competition with old lines as there is to-day. A monopoly is simply impossible. There is too much money and enterprise in the country for that, and railroads are too easily duplicated."

SPECULATIVE RAILROAD MANAGEMENT.

"There are many properties in this country which would be good investments if they had owners who would look after them and who would manage them as they would their private business, but this cannot be so, because there are comparatively few who have enough at stake to make them willing to devote their time and attention to its management.

"Unfortunately," Mr. Vanderbilt continued in a thoughtful strain, "many railroads are controlled and managed by persons who speculate on the daily or weekly receipts of their roads, and we find their presidents, directors and managers very active in publishing such receipts, telegraphing the condition of the crops, or the least thing that is likely to affect the temporary price of the stock, and changing their investments accordingly, without that regard to the interests of the corporation which they would doubtless have if these opportunities did not exist. The great difficulty is that speculation has got possession of the people, and there are very few who are able to withstand its fascinations. Hardly a day passes that I am not called upon to help some one who has lost his or her—the women have it as bad as the men—all on a venture in stocks. If assistance is rendered with the promise not to speculate again it rarely happens that I do not either hear of another loss or the applicant returns with the same story. It is really wonderful to see to what extent the spirit of speculation is carried nowadays. Construction companies are formed by capitalists and speculators to build railroads, not as legitimate enterprises which they intend to own and run, but for purely speculative purposes and to depress the market value of other interests. The immense amount of inflated securities which they place before the public increases the volume of speculation still more, and will only heighten the disaster when the great crisis attending all such speculation finally comes."

GREAT RAILROAD MEN.

"Who are the greatest of your compeers in railroad management, Mr. Vanderbilt, in your opinion?"

"I consider Thomas A. Scott the best railroad manager and executive officer I ever came in contact with. Jay Gould is very able and shrewd. He is reported to be engaged in many enterprises covering a vast amount of territory. His investments, I suppose, vary with the times. He is very suggestive and quickly grasps a subject. He always displays great ability on whatever he may concentrate his attention. Mr. Jewett has had much railroad experience, and I consider him a man of superior judgment and ability. J. W. Garrett stands among the foremost of our railroad men. One of the broadest and clearest headed men in the railroad world is Albert Fink, the present Railroad Commissioner of the Trunk lines."

CONTROLLING WALL STREET.

"Is it true that you can control speculation in Wall street when you like to do so?"

"What nonsense! Why, there are twenty men down there who could go round me three or four times before breakfast—no, not twenty, but a hundred and twenty!"

"But it is claimed that your ability to deal in huge blocks of stock at a time affects the market when you are credited with a speculative move."

"What of that? Supposing that I could buy or sell 50,000 or 100,000 shares at a time? They deal in 700,000 shares a day in Wall street nowadays. I should have to be in it all the time to even attempt it. (Raising his voice.) And supposing I had it all? Supposing I could get all the money there was down in Wall street? I should only be a devilish sight worse off. (Mr. Vanderbilt, after speaking in tones of great earnestness, now relapsed into his playfully smiling manner, indicative of so much inward happiness and contentment.) No, my dear fellow, I tell you the nicest thing in this world is to be satisfied with what you have, and that's what I am. I don't care to accumulate any more wealth; I have as much as I want; the only thing I am looking after is to see that the other fellows don't get away with what I have. The Commodore used to say that it took a good deal smarter fellow to keep money than to make it. I would be a very silly fellow, with no earthly want to fill, to go down into the street and go into competition with men who make a business of speculation, who, as I said before, could walk round me three or four times before breakfast any day. No, I am the guardian of a great trust, of a valuable estate, and that position and its rewards fill all my human ambition and desire."

Contributions.

Office and Duties of the Auditor.

TO THE EDITOR OF THE RAILROAD GAZETTE:

There is probably no railroad official whose duties vary more on different roads than do the duties of the Auditor. On some roads this officer is delegated with considerable power, and his position is esteemed a very important one; his duties and prerogatives are as well defined, and his wishes and opinions receive as respectful consideration as do the wishes and opinions of any of the other departmental heads. But, again, on many other roads his status is radically different; he is merely looked upon as a head clerk, who is well enough in his place, and is supposed to be thoroughly conversant with the intricacies of accounts, and to be efficient and faithful in connection with the performance of a certain species of routine labor, and his services in what is considered a rather unimportant position are deemed very satisfactory. Still, his judgment in relation to general railroad matters is not rated as very valuable, and any plans he may devise for a better and more effective clerical service, or any changes in accounts that he may recommend with the intention of creating greater safeguards in relation to the collection or disbursement of the revenue of the company are made entirely subordinate to the plans or suggestions of the Superintendent, General Freight Agent or some other departmental officer. Any suggestion that he may offer, even in matters strictly pertaining to the accounts, is treated with a certain degree of contempt. His plans are designated as "red-tapeism;" and that epithet is thought to be sufficient answer to the best argument he can advance in support of his recommendation. The simple fact that he is an office-man, connected entirely with the accounts, is taken as indisputable evidence that he does not possess that especial quality that is rather vaguely termed "executive ability," and that, owing to the non-possession of this essential element of character, he is absolutely incompetent to form any accurate opinion on any portion of the railroad business not entirely pertaining to the accounts, and that the incontrovertible conclusion must be that he should hold a subordinate position and not be treated as the peer of the other heads of the departments, and that the requirements and organization of his department should be matters of secondary importance.

In some cases this view of the matter may be right to a certain degree, but then the fault is in the man that holds the position of Auditor rather than being any reflection on the importance of the office. An incompetent man degrades any position, whether he be a General Manager or a brakeman. His incompetency does not lessen the responsibility of the position, but the more responsible his position the more glaring is his incompetency shown.

It is with no desire to lay claim to any especial superiority for the audit department that the matter is herein discussed, but rather seriously to inquire whether this department receives the attention that its importance really entitles it to. With this object in view, we will, at least, attempt to investigate, without bias of any kind, what really should be the duties and authority of the Auditor of any well organized road.

The first question that naturally arises in this connection is this: For what is the creation of the office of Auditor designed? Is it merely to elaborate some system of abstract bookkeeping? Should the duties of the Auditor be confined to the systematizing of the general accounts? We think not. This hardly covers the entire ground intended to be covered by the creation of the audit department. While the systematizing of the general accounts is certainly very necessary for the preparation of comprehensive and accurate statements of the condition of the company whenever such statements may be desired, still the duties of the Auditor do not by any means terminate here. Among other things it is his duty to systematize all the accounts of the various departments, so that they will blend together in a harmonious whole, and thereby make it possible to trace any transaction from the general audit office back to the fountain head of the original entry made at the date of the transaction, and by or under the direction of the railroad employé responsible for the transaction. In the office of the Auditor should be kept complete records of all items of revenue and expenditure, showing the same with the fullest possible details. With all due deference to the excellent judgment and extended experience of Mr. Kirkman, we can hardly agree with him in his statement that the Treasurer or Local Treasurer should have charge of the general books and accounts of the company. The Treasurer is the custodian of the funds of the company. This certainly is a very responsible and honorable position, but it would seem that his duty should consist of taking care of all moneys remitted to him from the various departments, collecting all amounts due the company as reported to him by the Auditor, and to pay all claims against the company after they have passed regularly through the general accounts, and

have been certified to by the Auditor as being correct. The proper function of the treasury department is to receive, take care of and disburse the funds of the company, leaving it entirely to an independent department to see that the agents and other employés of the company remit to the Treasurer the amounts due from them. The illustration of the system of the United States Treasury Department is hardly applicable to the matter under consideration. The conditions of the two cases are not exactly analogous; but, if they were similar, the illustration could not be taken as indisputable evidence that the federal system is *the best* that could be devised. Without going into details, thereby bringing politics into the question, it may only be necessary to mention that we *have* heard serious charges made against the management of the national treasury, and that the accounts were not as clear as might be desired. Though these charges were made by the "outs," it is only reasonable to presume that they were *sometimes* honestly made, and, at least, *sometimes* had a slight foundation of truth. When investigating committees have been sent to investigate, the Treasurer has not always been able to satisfy all members of the committee that everything was regular and honest. But politics and railroad management are two different things; and while the Secretary of the Treasury may prosper under very serious accusations while his side is in power, no Treasurer of a railroad company can afford to have even the slightest insinuation against the integrity of his department; hence, we say, the illustrious example of the United States Treasury to the contrary, notwithstanding, it is preferable in railroading that as a check on the Treasurer there should be established an independent department that does not receive or disburse any of the funds of the company, but to whom the Treasurer should report all the transactions of his department, and that these reports should be substantiated by corroborative evidence gathered from other sources. In other words, at stated periods—daily, if necessary—the Treasurer should render to the audit office detailed statements of his cash receipts, which should be compared with the reports of remittances as furnished by the agents, conductors, etc., and with the collection bills sent to the Treasurer for collection from the audit office. In reference to the disbursements made by the Treasurer, at regular periods a detailed statement should be rendered to the Auditor, and with these statements should be sent the vouchers that were shown on the statement as being paid. If, upon a comparison of the statement with the vouchers, everything proved regular, the statements agreed in amount with the total of the vouchers rendered, and the vouchers furnished were the same that the statement claimed to be paid, and the vouchers were such as had been duly entered in the books of the audit office, and were regularly approved by the proper officers, then the statement could be certified to as being correct, and the Treasurer receive the proper credit for the same. After this examination, and after the vouchers were indorsed by the Auditor to show the final audit, they should be returned to the Treasurer to be filed in his office. It may be claimed that this is nothing but "red tape;" that the paid vouchers being at all times in the Treasurer's office and so easily accessible, if any thing irregular in the Treasurer's account were suspected, or an examination of his accounts were desired at any time, they could be examined in his office. Regarding this point, it may be only necessary to say that an examination to be of any value should be thorough and so close as to inspect every detail. This can be better done by being done from day to day, while everything is fresh in the mind. In fact, the vast amount of details connected with railroad business makes this practically about the only way a satisfactory examination can be made, and it is for this reason that the examination of the accounts of the Treasurer is claimed to be one of the functions of the audit department. By this advocacy no reflection is intended upon the character of the treasurers of the railroad companies. They undoubtedly hold as high a rank for character and ability as any class of people that can be found anywhere; and it is from this high estimation of their character that we think they would be warm advocates of any system that would the more clearly demonstrate that they were faithfully performing the duties of their important position; unless it may be that they look upon the establishment of this independent department as an invasion upon their prerogative. While the Cashier and Paymaster undoubtedly should be connected with the treasury department, it is no less beyond question that on every road that has sufficient business to make these officers necessary, the Auditor of Disbursements, Auditor of Passenger Receipts, Auditor of Freight Receipts, General Book-keeper and Car Accountant should be on the staff of the Auditor, and be subject to his orders and supervision. Whether the road be large or small, the duties of these subordinate positions should be performed by the audit department. All bills against the company for material and supplies should be certified to by the Purchasing Agent or other officer through whom the material and supplies were ordered and received, certifying that the quantities and prices are correct, and that the articles named upon the bills were really the articles furnished. Bills for all other indebtedness of the company should be certified by the heads of the department to which the expenditure or claim was related. If, in accordance with the system of any road these disbursements should be approved by the General Manager, this could be done either before the accounts were vouchered, or his approval could be indorsed on the voucher as may be preferred. It should be the duty of the Auditor of Disbursements to see that these accounts were properly vouchered, and the vouchers regularly entered and charged against the account to which they were a proper charge. After the indorsement of the Auditor, or General Auditor, whichever he may be termed, the vouchers should be passed to the Treasurer for payment. It should not only be the privilege of the General Auditor to sign all vouchers, but it should be his duty *not* to sign any voucher until he was fully satisfied that it was an honest claim against the company and was one that had not been previously paid. The Treasurer should be required to decline payment of all claims coming to his office in an irregular manner and which had not passed through the audit office and received the approval of the Auditor. The pay-rolls, if not prepared in the audit office, should be placed before the Auditor for his examination and approval before the Paymaster is at liberty to pay them, and should again be subject to his examination before the Treasurer or Paymaster receives credit in the general accounts for payments made on them.

Without going too deeply into the details of the work of the audit office, the following brief outline of the duties of that branch of the service may be presented: It should closely examine all way-billing, the reports of freight received and forwarded, reports of ticket sales, and all other accounts of station agents, conductors, etc. It should prepare all joint freight and passenger accounts with connecting roads. The business of all outside agencies should be under its supervision as far as the accounts are concerned. The traveling auditors of the company should be subject to this department and should make all reports direct to this office. The car records and mileage accounts should be kept by this office; monthly reports of amounts due the company from connecting roads being sent to the office of the Treasurer, so that he could send drafts for same, and mileage vouchers for amounts due other roads be made out and passed to the Treasurer for payment. The audit office should be furnished with copies of all tariffs, special rates and contracts made by the General Freight Agent, so that they could compare the same with the way-billing, and act on claims for drawbacks, rebates and overcharges. These claims should all be recorded in this office and entered in the proper books before being paid. The passenger department should also furnish the audit office with a complete record of all passenger rates, and divisions on through business, and advise it promptly of all changes in same. This office should also have a list of all contracts for the lease of real estate, track privileges, rolling stock, or of any other nature, which record should show full particulars on every essential point. As its connection with the treasury department has been referred to before, it is unnecessary to mention it here. From the transportation department, the necessary reports should be rendered in connection with items of train expenses. The audit office should be furnished with accurate monthly statements showing fuel purchased, amount used and stock on hand at end of month. From the Purchasing Agent it should not only receive the bills for all purchases made by him, but an itemized account of how the materials were disposed of. From the machinery and car department it should have monthly statements, showing what material was received during the month, amount used and to what accounts it should be charged, and the amount of stock on hand at end of month. It should also receive a detailed distribution of the rolls of this department. From the road department it should receive similar statements, accounting for iron, ties, etc., received, used and on hand, also showing distribution of labor. The system of departmental accounts should be subject to the approval of the Auditor, as far as they related to the general accounts, and he should have authority to require that they should be kept so as to show any information that he might deem necessary to be shown. The General Book-keeper, being included in the staff of the Auditor, should have charge of the preparation of the annual balance sheet and all other general statements to be presented before the directors. He should prepare the annual reports furnished the state.

Another way in which the audit office can render good service is in the compiling of statistics. The value of accurate statistical information is acknowledged by every intelligent railroad official. Their preparation is no longer looked upon as useless and labor thrown away. Experience teaches that the more thoroughly a matter is investigated the more likely it is that valuable information can be obtained. The amount of valuable statistics that can be compiled is so great that it is hardly necessary to specify. They relate to every branch of the service; they admit of more economical and satisfactory service; they demonstrate, in a degree, at least, the relative value of various classes of traffic; they show the comparative value of different kinds of material; the direction of traffic, the proportion of paying freight to dead weight; they are useful in every railroad transaction, from the preparation of a time schedule, to the most insignificant action. Of course, this is if the statistics have bearing on the matter in hand and are accurate and comprehensive. As under the system herein mentioned the Auditor is assumed to be a disinterested examiner of the records of the transactions of all the other departments, it would appear as if he should not hold his position at the will of any other officer; that he should not be appointed by the President or General Manager, but should be elected by the board of directors in the same manner that the Treasurer and Secretary are elected. By this means, the board would at all times have an active representative, who would be familiar with all the operations of the road, and who could collect and present for their inspection whatever information about the workings of any department that circumstance should render it advisable that they should be made acquainted with. As he would not be in any way responsible for any policy that the management might adopt, he would be the better qualified to demonstrate in some degree the advantages and disadvantages resulting from the adoption of any certain scheme. This he could do in all honesty and without bias, as his pride would not stand in the way of a cold but true analysis of the results of a project with the inception and execution of which he was not directly identified. If the workings of his office were properly systematized and sufficiently comprehensive, he could collect a mass of information in relation to any matter that cannot be, or, in any event, is not likely to be, in the possession of any other department. The executive officers—General Superintendent, General Freight Agent and the others are too much occupied with the careful and watchful inspection of the ordinary—and sometimes extraordinary—workings of their departments, to devote much time to the accumulation and arranging of a vast amount of detailed information that they might or might not find useful. The great responsibilities resting upon them and the active and eventful experience of their positions are of such a nature as to have a tendency to disqualify them for the careful and painstaking task of compiling any very great amount of dry data, or, at least, to render such an occupation exceedingly distasteful to them. And should they endeavor to procure this knowledge it would be, generally speaking, with a stronger desire to sustain the position they may have taken upon the question under consideration than through any aspiration for the more thorough understanding of its various bearings. If it was something concerning which they had expressed their opinion, they would consider their reputation committed to its strong support, and their pride would prevent their warmly welcoming any evidence that would prove that they had been in error. This is not intended as any reflection upon the intelligence or character of these executive officers, but they are human as well as all of us, and just as likely to err. And if there is any way that their services can be made more valuable to their company, they should not find fault, even if this improvement came through the instrumentality of another department. It would be much better if they not only availed themselves of any advantage that they could derive through the service of the audit office, but strive to co-operate with it in all projects that would be likely to result in the general advancement of the efficiency of the entire service. How much better and how far pleasanter this would be than if stimulated by a petty jealousy, and fear that their authority and prerogatives might be in some measure infringed upon, they place themselves in opposition to the audit department, and in every possible way attempt to embarrass its workings. With his practical knowledge and extended experience, the judicious Superintendent could suggest the desirability of keeping a detailed account of a certain item of expenditure for some especial purpose, and, through the means of the information thereof furnished by the audit office upon his request, be enabled to institute great economies that would reflect credit on his judgment, and which he could not have instituted without the assistance of the audit office. It was only through the co-operation of the audit office that he obtained the accurate information on which to base his actions intelligently. The General Freight Agent frequently finds himself without adequate data in relation to the magnitude of and earnings from a certain species of traffic, that if he acted in harmony with the audit department that office could be competent to furnish him. And so it is with all the other departments; they cannot help but be benefited by a harmonious and intelligent understanding with the audit department.

Concerning the relation of the audit department with the appointment and retention of employés, it should stand in the same position as any other department. It should not have any superior rank in regard to the retention or dismissal of an employé, who, while he had been faithful in his relation to the audit office, had been derelict in his performance of duties devolving upon him in connection with some other branch of the service. Neither should the fact that an employé's services had been satisfactory to the Superintendent or General Ticket Agent, be any reason why he should be retained in the service after his dismissal had been requested by the audit department. In case of conflict between two departments in relation to the dismissal of an employé, the matter should be referred to the decision of the President or General Manager, whichever officer had the supreme voice in regard to the employé. In fact, unless it be in cases of glaring and unquestionable dishonesty or drunkenness, we do not think that any head of department should have permission to dismiss an employé, until that dismissal had received the sanction of the Manager. The power of suspension pending the action of the Manager is sufficient latitude in power to be delegated to any head of department, and any greater power is apt to be prejudicial to the best interests of the road. It may be asserted that the great authority given to the auditorship as here advocated would, in the hands of a meddlesome and quarrelsome man, materially interfere with the smooth working of the road; that instead of being an instrument to promote the welfare of the company, the position when filled by such a man would be detrimental to the company's best interests. Granted; but an incompetent or unworthy man in any position would be likely to neglect his work and prove unprofitable to his employers, and prevent the operations of his department from being successfully conducted. If, in addition to this, he were inclined to be unduly inquisitive and of a quarrelsome disposition, he would be very likely to have difficulty with every other official he came in contact with. This should hardly be presented as an argument against the position. It would be no more likely to occur in the audit department than in any other department, and the consequences would be no worse. Every architect in designing a building takes it as a matter of

course that good material is intended to be used, and it is on the same hypothesis that the advocates for an independent and honorable position for the Auditor lay their claims. The ideal Auditor they consider must be of excellent character and ordinarily amiable disposition; be energetic and equal to the demands of hard labor and close application; of keen perception and good analyzing powers; quick to see where improvements in his department are needed, and placing all plans and suggestions under a careful analysis before they are approved or adopted. He should be thoroughly conversant with accounts and the intricacies of figures, and competent to prepare with clearness and accuracy all statements that are necessary to show the financial condition of the company, the amount and nature of its traffic, the various expenses connected with the operation of the road and the endless variety of data so valuable in connection with the intelligent management of so important an interest. With reasonable confidence in his own power, he should fully recognize the fact that he has still much to learn, and treat with respect and deference all recommendations that may come from the other officers, and, if not conflicting too much with the general system of accounts, always be ready to adopt any suggestion that may be sustained by good proofs. Gentlemanly and considerate in his intercourse with his associates or subordinates, he should exert himself at all times to avoid, so far as he can consistently with his obligations to the company, all cause for trouble or dissension with every one. Such an officer, consequently, we find treated with respect and confidence by all. Studious and ever on the alert, he desires to sustain with honor and credit the responsibilities of the high position to which he has been called. Honest from conviction, and devoted to the interests of his company, his untiring zeal is devoted to the eradication of all abuses in the service wherever they may exist. This he endeavors to accomplish, not so much through persistent interference as through the medium of directing the attention of the proper official to correct the abuse. Strong in his position, knowing that he is only responsible to the President and the board of directors, he can afford to be above all petty bickerings, and can act promptly, without fear, and with strict impartiality toward all. It may be asserted that a man possessing the commendable qualities herein described would not be likely to aspire to the position of Auditor; that he would be qualified to fill with credit a more important position. We think this is not quite correct. If the position of Auditor were placed upon an equally honorable and remunerative footing with that of the other heads of departments, there is no reason why ambitious and competent men should not accept it as readily as any of the other departments. When filled by a man up to the required standard, the auditorship will be worthy of the confidence and friendly feeling of all the other departments, and through co-operation they can promote the interests of the company and there will be no occasion for conflict of authority. * * * * * *

Connecting or Transition Curves.

BY A. M. WELLINGTON.

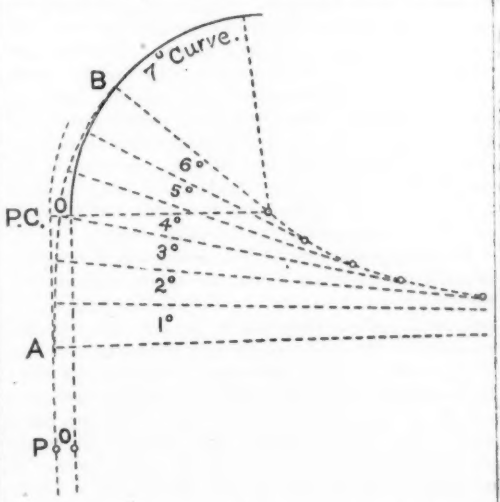
It is a matter of real importance for the easy passage of trains that the change from tangent to curve and *vice versa* should be gradual, just as with the elevation, instead of taking place abruptly at a fixed point. To do this effectually is a very simple matter, requiring no calculation in the field, nor any perceptible interference with, or addition to, the ordinary field practice. Being so simple, therefore, it *should never be omitted* in locating sharper curves than 2° or 3°.

The importance and advantage of such curves would be more generally appreciated by engineers if they were aware of the fact that the trackmen always put them in if the engineer does not, and that they are, in fact, absolutely essential to the smooth riding of trains. The way a trackman puts them in is by throwing the track inward at the P. C., thus introducing a gentle curve backwards on to the tangent, but at the expense of a sharp place in the curve itself, of materially shorter radius than the rest of the curve. At this sharp point much of the jerk occurs which is perceptible on the train, but even this is less than would arise if the track were left and maintained as staked out by the engineer; *as it never is*, unless, perhaps, in some instances where it has been unfortunately insisted upon. It will almost invariably be found on old tracks that the curve extends about 100 ft. back of the original P. C.

The curve really required to ease off the ends of circular curves is the *cubic parabola*, a property of which is that its "degree" at any given point is almost exactly as the distance from the P. C. The true parabola, as elsewhere pointed out, has no such property, despite a prevalent impression to the contrary. The radius of a parabola does, indeed, increase from the centre towards the ends, but so slightly that it is practically a matter of no moment. What is really required is a *uniform* radius for the main body of the curve, with a short connecting or transition curve at each end with a *rapidly* changing radius.

An almost precise equivalent for the cubic parabola, and one more simple in use, is a compound circular curve which shall be say, 1° curve for the first 50 ft.; a 2° curve for the second 50 ft.; a 3° curve for the third 50 ft., etc.; and for the last 50 ft., 1° less than the degree of the main curve. The curvature will then exactly fit the elevation, if put in by a very common rule, which is to "taper it out" at the rate of 50 ft. for each degree of curvature. On a line of very easy curvature, however, and often for topographical reasons, it may be desirable to use a longer transition curve, changing only ½° in each 50 ft.; and on the other hand, for very sharp curves, the transition curve becomes too long, and it is preferable to use one changing 1° in every 25 ft.

The demonstration of the manner of obtaining the curves is omitted. Those disposed to check the tables will find it easy to demonstrate that the offset *O*, Fig. 1, at the P. C., and the connecting curve *A B* bisect each other, and that the intermediate offsets both from the tangent and from the main curve are the same. The total length of the curve, of course, follows directly from its definition, and the computation of the intermediate offsets is a mere detail. Tables I., II. and III. below give the necessary data, thus computed, for use in the field.



TABLES OF OFFSETS FOR CONNECTING CURVES.

TABLE I.

Giving a connecting curve **increasing 30′ in curvature every 50 ft.,** beginning with a 30′ curve and ending with a curve 30′ less than the degree of the main curve.

Degree of Main Curve.		2°	2° 30′	3°	3° 30′	4°	4° 30′	5°	5° 30′	6°
Offset at P. C. of main curve		0.60	1.10	1.96	3.06	4.64	6.54	9.04	11.98	15.64
Offsets from both tangent and main curve to connecting curve at points 25 ft. apart, measuring from P. C.	275									.00
	250								.00	.03
	225							.00	.03	.11
	200						.00	.03	.11	.30
	175					.00	.03	.11	.30	.55
	150				.00	.03	.11	.30	.55	.98
	125			.00	.03	.11	.30	.55	.98	1.53
	100		.00	.03	.11	.30	.55	.98	1.53	2.32
	75	.00	.03	.11	.30	.55	.98	1.53	2.32	3.27
	50	.03	.11	.30	.55	.98	1.53	2.32	3.27	4.52
	25	.11	.30	.55	.98	1.53	2.32	3.27	4.52	5.99
At P. C.		.30	.55	.98	1.53	2.32	3.27	4.52	5.99	7.82

This table gives a longer and gentler connecting curve than is ordinarily necessary. The following is to be preferred as a rule:

TABLE II.

Giving a connecting curve **increasing 1° in curvature every 50 ft.,** beginning with a 1° curve and ending with a curve of 1° less than the degree of the main curve.

Degree of Main Curve.		3°	4°	5°	6°	7°	8°	9°	10°	11°
Offset at P. C. of main curve		.44	1.10	2.18	3.82	6.10	9.16	13.12	18.00	24.00
Offsets from both tangent and main curve to connecting curve at points 25 ft. apart, measuring from P. C.	250								.00	.06
	225								.00	.06
	200							.00	.06	0.22
	175						.00	.06	.22	0.55
	150					.00	.06	.22	.55	1.09
	125				.00	.06	.22	.55	1.09	1.91
	100			.00	.06	.22	.55	1.09	1.91	3.05
	75		.00	.06	.22	.55	1.09	1.91	3.05	4.58
	50	.00	.06	.22	.55	1.09	1.91	3.05	4.58	6.56
	25	.06	.22	.55	1.09	1.91	3.05	4.58	6.56	9.00
At P. C.		.22	.55	1.09	1.91	3.05	4.58	6.56	9.00	12.00

TABLE III.

Giving a connecting curve **increasing 1° in curvature every 25 ft.,** beginning with a 1° curve and ending with a curve of 1° less than the degree of the main curve.

Degree of Main Curve.		5°	6°	7°	8°	9°	10°	11°	12°	13°	14°	15°
Offset at P. C.		.56	1.00	1.52	2.32	3.26	4.50	6.00	7.82	9.92	12.44	15.24
Offsets from both tangent and main curve to connecting curve at points 25 ft. apart, measuring from P. C.	175											.00
	150									.00	.01	.05
	125							.00	.01	.05	.15	.28
	100					.00	.01	.05	.15	.28	.50	.76
	75			.00	.01	.05	.15	.28	.50	.76	1.13	1.64
	50	.00	.01	.05	.15	.28	.50	.76	1.16	1.63	2.25	3.00
	25	.03	.15	.28	.50	.76	1.16	1.63	2.25	3.00	3.91	4.96
At P. C.		.28	.50	.76	1.16	1.63	2.25	3.00	3.91	4.96	6.22	7.62

TOTAL ERROR IN DISTANCE.

Being the excess in length of the connecting curve over the tangent and main curve chaining.

Table I.			Table II.			Table III.		
Curve.	Offset.	Error.	Curve.	Offset.	Error.	Curve.	Offset.	Error.
3°	1.96	.01	5°	2.18	.01	7°	1.52	.01
4°	4.64	.03	7°	6.10	.07	9°	3.26	.03
5°	9.04	.10	9°	13.12	.24	11°	6.00	.08
6°	15.64	.25	10°	18.00	.40	13°	9.92	.18
			11°	24.00	.65	14°	12.44	.24
						15°	15.24	.37

1. *Run the tangent A, Fig. 1, to the P. C. as usual.*

2. Instead of continuing the curve as usual, *make an offset, O, at the P. C., toward the centre of the curve* (given in the second horizontal lines of Tables I., II. and III.) *and make a similar offset at the back sight plug P.*

If the curve be an odd one, take the nearest even degree in either direction, it does not matter which.

3. *Run in the main curve as usual from the offseted tangent.*

4. From the tangent and curve as thus run in *make the offsets given in Tables I., II. and III.*, omitting any deemed unessential. The offsets are given for even multiples of 25 ft. from the P. C., and *they are the same from both the curves and tangent* at the same distance from the P. C. At the P. C., consequently, the curve passes through the middle point of the main offset, *O*.

TO RECORD THE CURVE IN THE FIELD-NOTES, nothing more is required than the letters C. C. and the main offset, as "C. C. 4.50" or whatever else it may be.

IN PROJECTING OR PLOTTING it is of course as easy to project a tangent to pass at a certain offset from the curve as to actually touch it. The eye can easily estimate the offset, on a scale of 400 ft. to an inch, without the use of a scale or a table. It will also, as a general rule, make it easier to fit the ground, especially as it makes it much less objectionable to use a sharper curve.

EXAMPLES.—*To Ease Off a 6° Curve; P. C. Sta. 27:* We may either use an offset of 15.64 ft. (Table I.), 3.82 ft. (Table II.), or 1.00 ft. (Table III.). Unless for topographical reasons, an offset of 3.82 would ordinarily be preferred. The offsets to the connecting curve will then be:

Station 26 ..... 0.06 ft.
" 27 (P. C.) ..... 1.91 " (half the main offset).
" 28 ..... .06 "

Practically no stake would be moved except at the P. C., and this is usually the case.

2. *To ease off a 10° curve, P. C., at 27+80:* We may use an offset of 18.00 ft. (Table II.), or 4.50 ft. (Table III.); ordinarily the lesser would be preferred. The minor offsets in either case, for the stakes which may be supposed to be set for construction, would be about as follows, estimating by inspection the change in the offsets due to the fact that the stakes set are not quite at even multiples of 25 foot from the P. C. In giving track-centres they may of course be run in at the correct distances.

	18.00 offset.	4.50 offset.
Station 26	0.2	...
" 27	2.7	0.1
" +80 (P. C.)	9.00	2.25
" 28	7.0	1.2
" +50	3.3	0.2
" 29	1.2	...
" +50	0.3	...

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EDITORIAL ANNOUNCEMENTS.

Addresses.—*Business letters should be addressed and drafts made payable to* THE RAILROAD GAZETTE. *Communications for the attention of the Editors should be addressed* EDITOR RAILROAD GAZETTE.

Passes.—*All persons connected with this paper are forbidden to ask for passes under any circumstances, and we will be thankful to have any act of the kind reported to this office.*

Advertisements.—*We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay,* EXCEPT IN THE ADVERTISING COLUMNS. *We give in our editorial columns* OUR OWN *opinions, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.*

Contributions.—*Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies, the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and in their management, particulars as to the business of railroads, and suggestions as to its improvement. Discussions of subjects pertaining to* ALL DEPARTMENTS *of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published*

STANDARD RAIL SECTIONS

A very large proportion of our readers will be much interested in the admirable paper on this subject read by Mr. Holley at the late meeting of the Institute of Mining Engineers, and which we give on another page. In that paper he has shown how costly the present diversity in the patterns of rails is to railroad companies and manufacturers. The argument which he uses applies, though, quite as well to a multitude of other articles which are consumed on railroads. The complaint of axle manufacturers is or was that in dull times they could not run their forges and accumulate a stock, because it was not at all certain that there would be a demand for the special kind of axles which they might make. Owing, however, to the extended adoption of the Master Car-Builders' standard axle, such manufacturers now do not hesitate to accumulate a supply of them when they have not orders enough to keep their men and machinery busy. Mr. Holley points out very forcibly how this same result would be accomplished with rails, if the different manufacturers would only agree on certain standard sections, and shows what an enormous sum would be saved to both makers and consumers by the adoption of common patterns. It would be possible to enumerate, probably, a hundred different articles used on railroads which, if reduced to standard forms and sizes, would be diminished in cost, and, at the same time, doing so would simplify and facilitate the operation of railroads. Uniformity is an old theme which has been discussed at every annual convention of the master mechanics and master car-builders. So long ago as Jan. 8, 1873, a committee was appointed by the American Society of Civil Engineers "to make an investigation to determine the following points:

"I. *The best form of standard rail-sections* for the railroads of this country.

"II. The proportion which the weight of rails should bear to the maximum loads carried on a single pair of of wheels of locomotive or cars.

"III. The best methods of manufacturing and testing rails.

"IV. The endurance, or as it is called, the 'life,' of rails.

"V. The causes of the breaking of rails in use, and the most effective way of preventing it."

The committee consisted of Messrs. Ashbel Welch, O. Chanute, I. M. St. John and M. N. Forney. This committee issued a circular which was published in the *Railroad Gazette* of Feb. 28, 1874, and its first report was published in our issues of July 11 and 25 of the same year. A subsequent report was also made, and will be found in the *Railroad Gazette* of Nov. 13, 1875.

It will be seen from this that the purpose of the committee was first "*to determine the best form of rail section.*" It confined itself, however, to designating the principles on which rails should be designed, and to its work, it is thought, more than anything else is due the general adoption of the patterns of rails which Mr. Holley says have "heavy beveled head, light web and flanges, and a good angle to hold the fish-plate." Whether it is to be regretted or not that the committee referred to did not designate some specific forms of rail sections, it would now be difficult to say. It is certain that the fact that such forms were not then adopted has permitted the untrammeled genius of many engineers and railroad superintendents to revel in the enjoyment of taking off a sixty-fourth here or adding a thirty-second there from or to otherwise excellent patterns of rails. Probably now any half-dozen of the most experienced and intelligent track superintendents, by whatever name they may be known, would have little difficulty in agreeing on a system of rail sections for general use.

The question then arises, why is it, when the enormous advantages which would result from uniformity, not only of rails but of the unnamed other hundred parts of railroad equipment, that it is so difficult to attain so desirable an end?

Mr. Holley says, perhaps truly, that "the reform in rails is certainly not to begin by making a new set of patterns." He says further: "The obviously reasonable and the only practicable solution is for railway companies to fix on, say, 10 patterns, each of different weight, from about 30 to 70 lbs., which must completely embody the settled principles of steel rail proportions, with reference also to the extent to which such patterns have already been adopted."

Guided by these principles Mr. Holley has selected 10 patterns, which will be found on another page. These patterns are very good ones, but Mr. Holley and any person who has investigated the subject, or has had experience in designing rail sections, must admit that with our present knowledge of the subject it would now be possible to design a much more perfect system. Thus the angle of the under side of the heads and top of base varies as follows: 10°, 12°, 12°, 13¼°, 15°, 16°; and in the remaining four sections it is not given at all. The relation of height to width of base varies within quite wide proportions. In some cases both are the same, and in the 65-lb. section the base is $\frac{6}{16}$ in. narrower than the height. The radius of the upper corners of the head are $\frac{7}{32}$, $\frac{5}{16}$, $\frac{9}{32}$, $\frac{5}{16}$, $\frac{7}{16}$ and $\frac{1}{2}$, taking them in the order of the weights of the rails. As this part of the rail should conform to the tread of the wheels, there is a special reason for its being the same for all rails, excepting those used on narrow-gauge roads.

We agree perfectly with Mr. Holley that if this compromise would bring about the much desired uniformity, it would be better to make it than to have the present diversity. But will it do it? As the case stands now, Mr. Holley has simply suggested it as one of the ways out of the difficulty. Who is to act on it? In its present attitude the railroad companies are quite certain not to do so. If the Institute of Mining Engineers were to recommend these sections, it would probably have little influence on the railroad men. If referred to the Society of Civil Engineers, it would probably have the same result.

What is needed to bring about uniformity of rail sections, as well as of many other parts of railroad equipment, is some authority representing the railroad companies to decide and establish, or at least recommend, such standards. In the absence of such an authority it will be in vain to propose compromises or perfect systems of rail sections. They will fall as lifeless as many other suggestions of similar character have before. But once organize such an authority, and it will be easier to have the most perfect system that can be devised adopted, than it will be to have the representatives of the railroads agree to a compromise. A standard for rail sections should, of course, not be adopted without consultation with the manufacturers, but if any system is recommended, let the rail-makers agree to charge, say several dollars a ton more for rails which are *not* standard patterns than for those which are. Such concurrence of action would be quite certain to result in the speedy and general introduction of any standard for rails that might be recommended by the representatives of the railroad companies.

The question may then be asked, what practical measures should be adopted to accomplish what has here been proposed? To this it may be answered that what seems to be needed is an organization of railroad officers to consider questions relating to permanent way, bridges, buildings and signals. No such association is now in existence, excepting that of the road-masters, which covers the ground only partially.

To accomplish the purpose for which it is intended, an organization of this kind must be controlled by the railroad companies themselves, otherwise it cannot secure their confidence. The fact that the companies have no such control over either the Master Mechanics' or the Master Car-Builders' Association is without doubt one great reason why they have not the influence they might and should have.

For these reasons the representatives of such an organization should be appointed annually by the presidents, general managers or general superintendents of the different roads. Associate members, such as rail-makers and others, whose knowledge and advice might be considered valuable, could be admitted, but without the right of voting, as is at present the case in the Master Mechanics' and Car-Builders' associations.

There are certain other principles which it would be necessary to observe to make such an organization successful. Thus, the big roads will not be content to have no more voice in what is done than the little ones, therefore each company should be entitled to one representative and vote; irrespective of its length or the amount of its business. In addition thereto, each one should have an additional representative and vote for each hundred locomotives it runs. The additional votes might be cast by one representative if desired. The number of locomotives owned is probably the simplest and fairest practicable basis of representation. Mileage is not just, as some long roads have little business, and other short ones have a great deal.

As few companies would be willing to agree to be bound by the action of such an organization, it should be distinctly understood that it will have only recommendatory power.

The same feeling would probably exist in relation to the expenses, and some companies might object to agreeing to pay a sum which it would be difficult to fix beforehand: therefore, the assessments for each year should be made the year in advance, each company to have the privilege of paying or not as it might think fit, non-representation to follow non-payment; the assessments to be made on the same basis as the representation.

As a definite and practical measure we believe that if the signatures of eight or ten of the presidents of the principal roads could be secured to a call, somewhat like the one which follows, the adoption of standard rail sections, rail fastenings, signals, and many other portions of the permanent way of railroads, would follow as certainly as cause follows effect. The call might be somewhat as follows:

Whereas, Great expense, confusion, delay and often accidents result from the present diversity of rails, rail fastenings, frogs, switches, signals and other portions of railroad equipment pertaining to the track or permanent way, therefore it is desired that an organization be formed of representatives of the railroads in the country to make investigations, suggest improvements, and recommend standard forms and propositions for these appliances, so as to bring about uniformity and improvement in their construction.

You are therefore requested to send one or more representatives to consider the advisability of organizing such an association on the following basis:

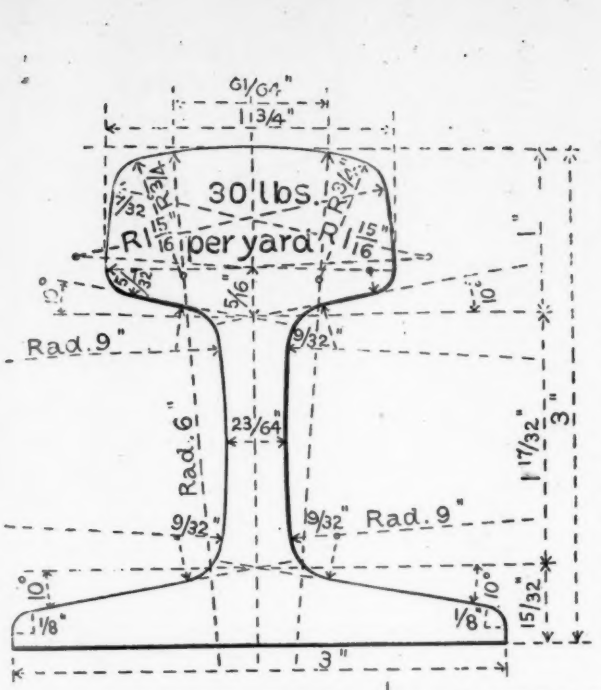
I. The representatives to be appointed annually by one of the principal executive officers of each road; each company to be entitled to one representative and vote, and in addition thereto one for each hundred locomotives it owns.

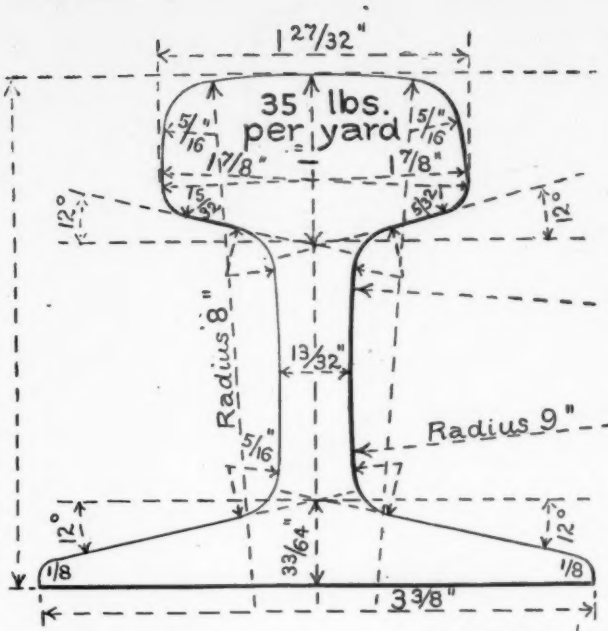
II. The expenses of the association to be apportioned on the same basis, and the assessment for each year to be made the year before.

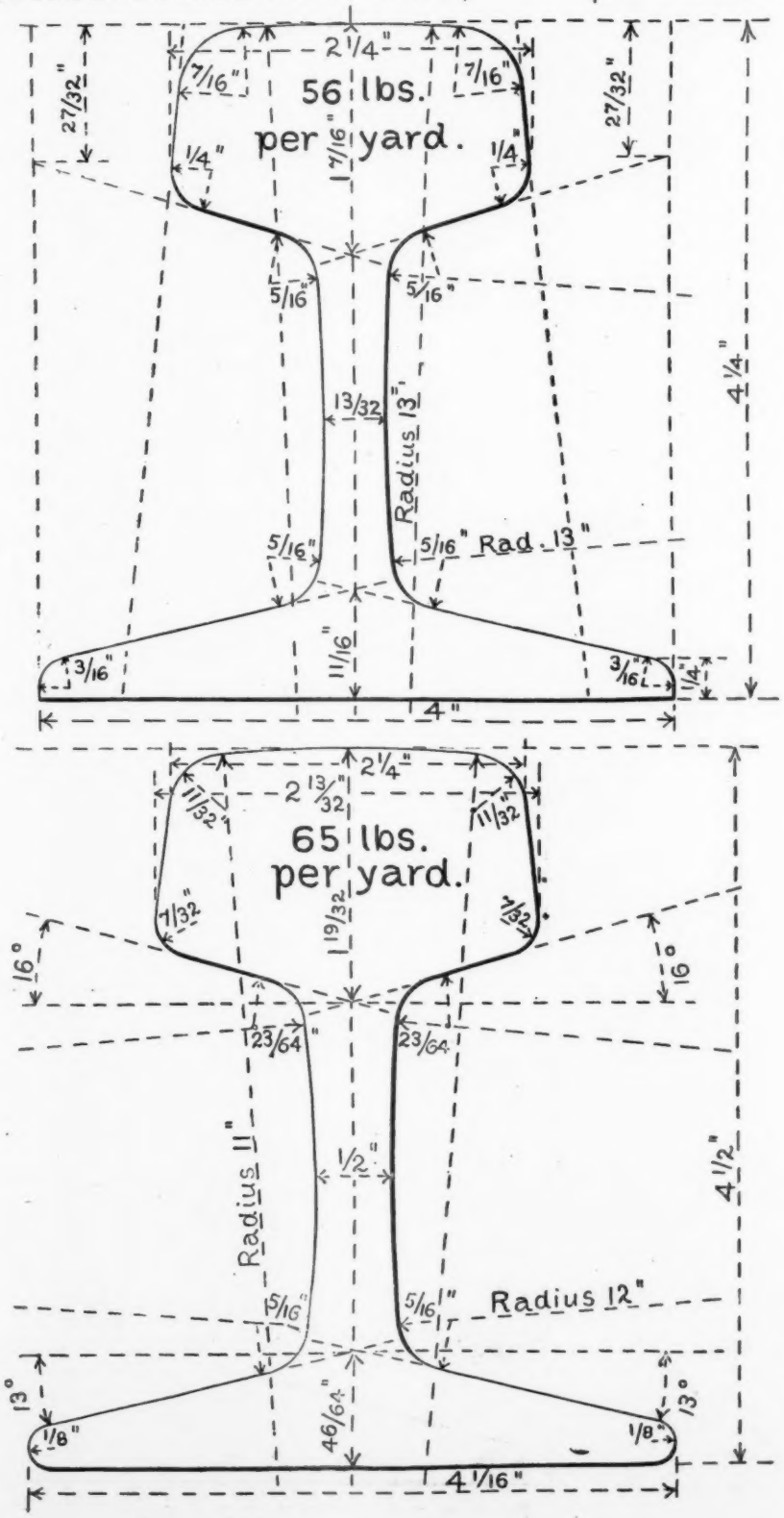
III. The association to have only a recommendatory power.

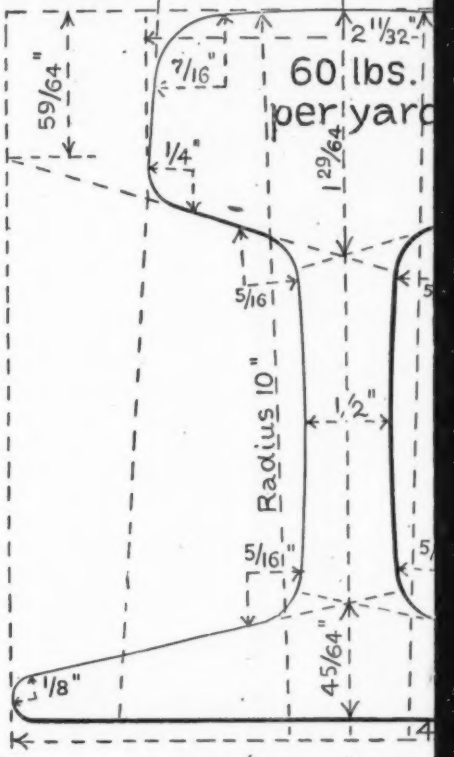
As was said before, all that is needed is to induce eight or ten of the most prominent railroad presidents or managers to sign such a call, and the reform which Mr. Holley has so ably recommended will be certain to follow.

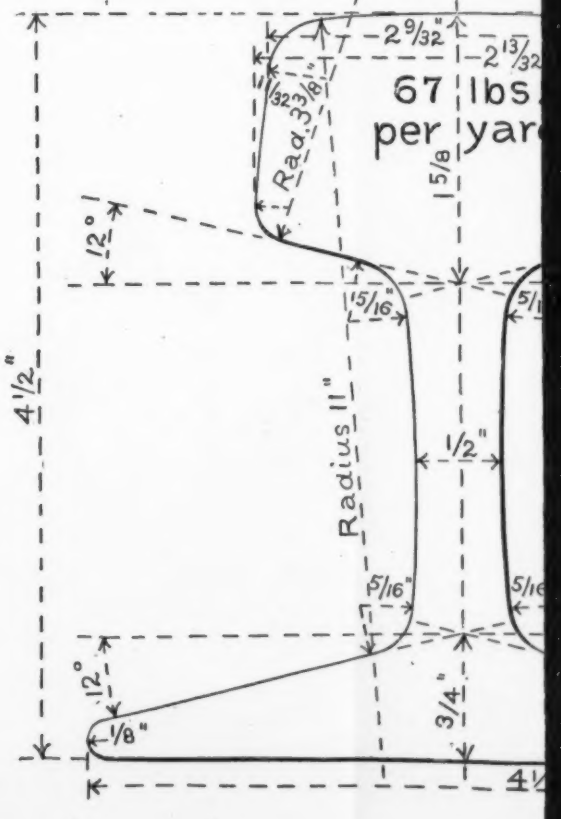
The *Railroad Gazette* modestly offers to become the receiver of any signatures or communications with reference thereto which its readers may be moved to contribute for the accomplishment of the purposes set forth.



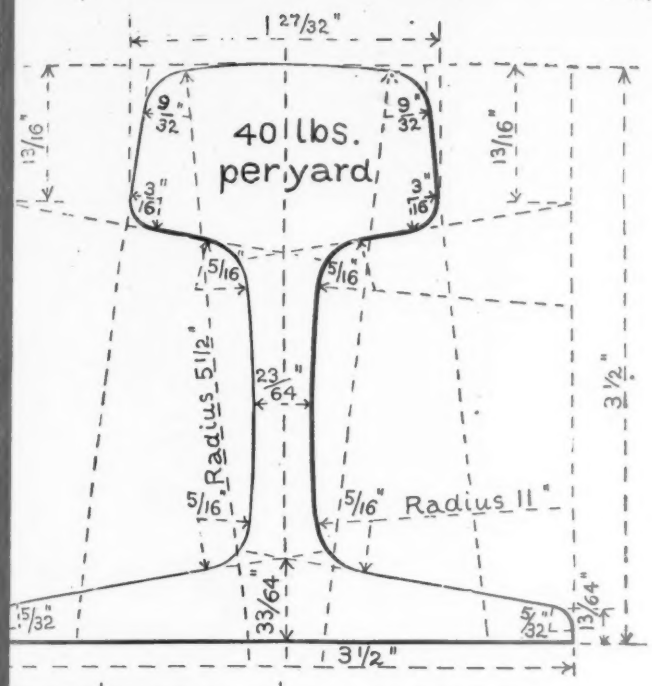


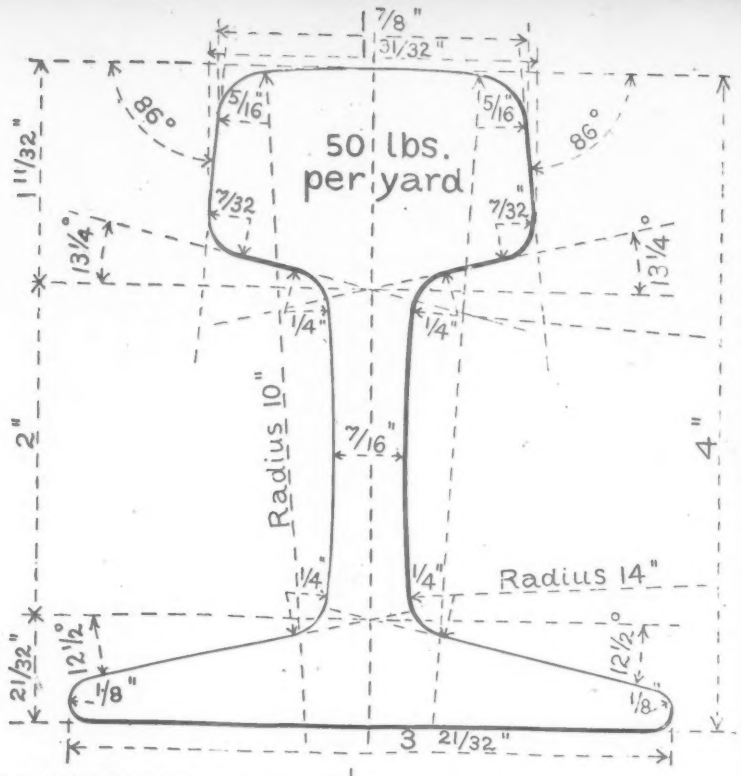


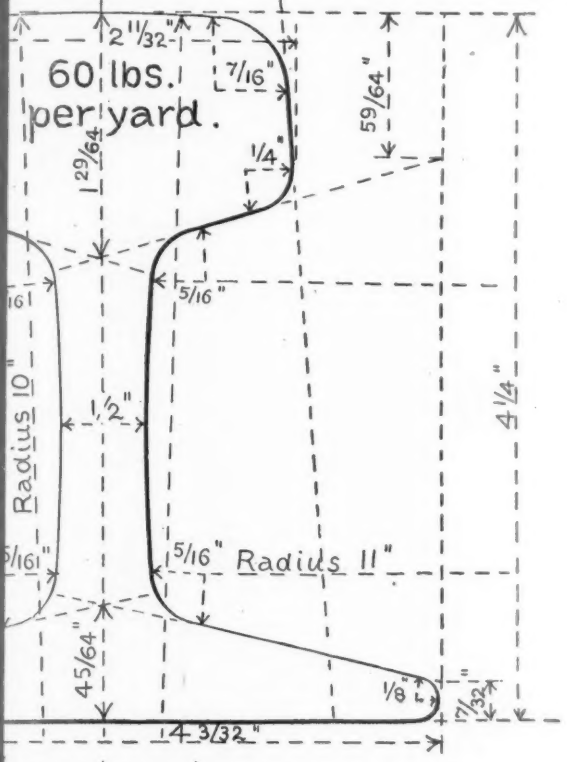


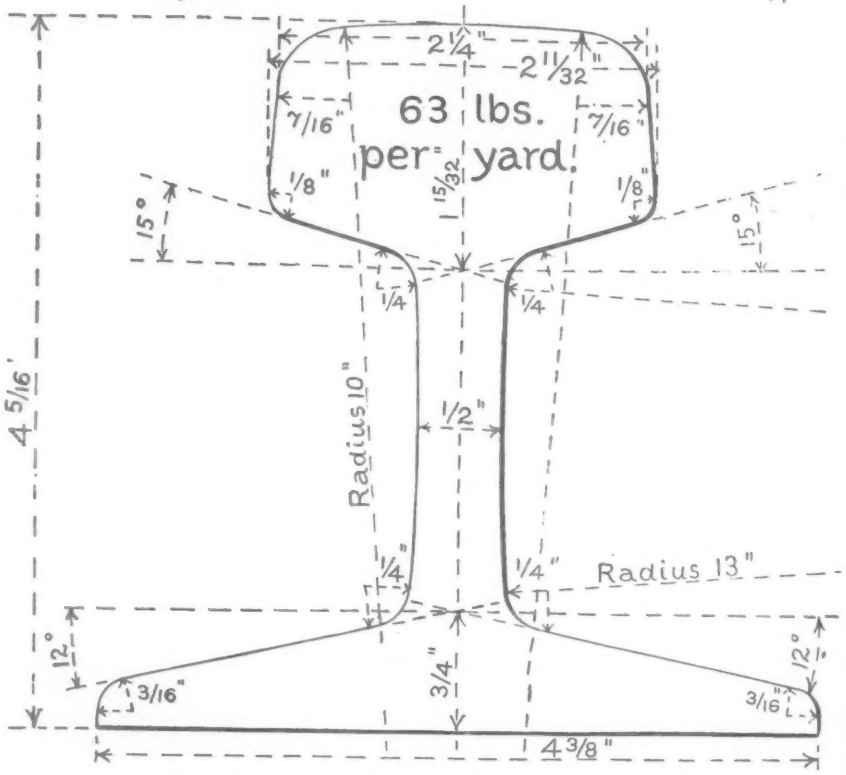


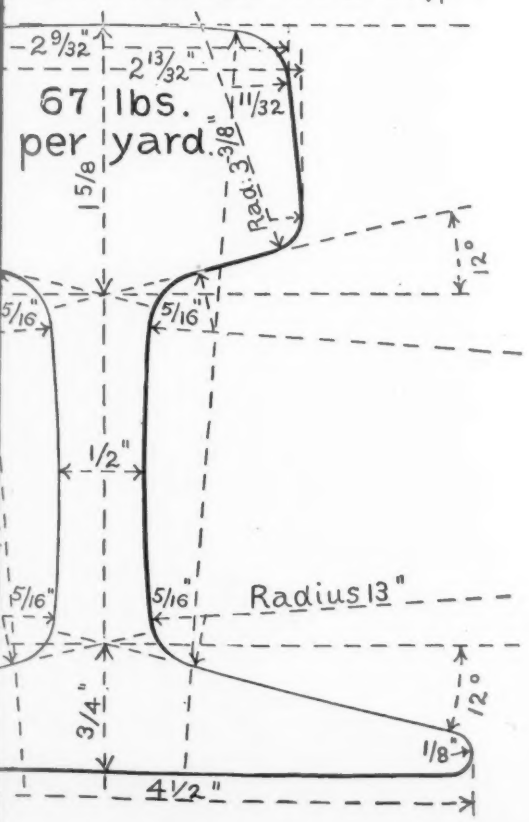
STANDARD RAIL SECTIONS PROPOSED BY

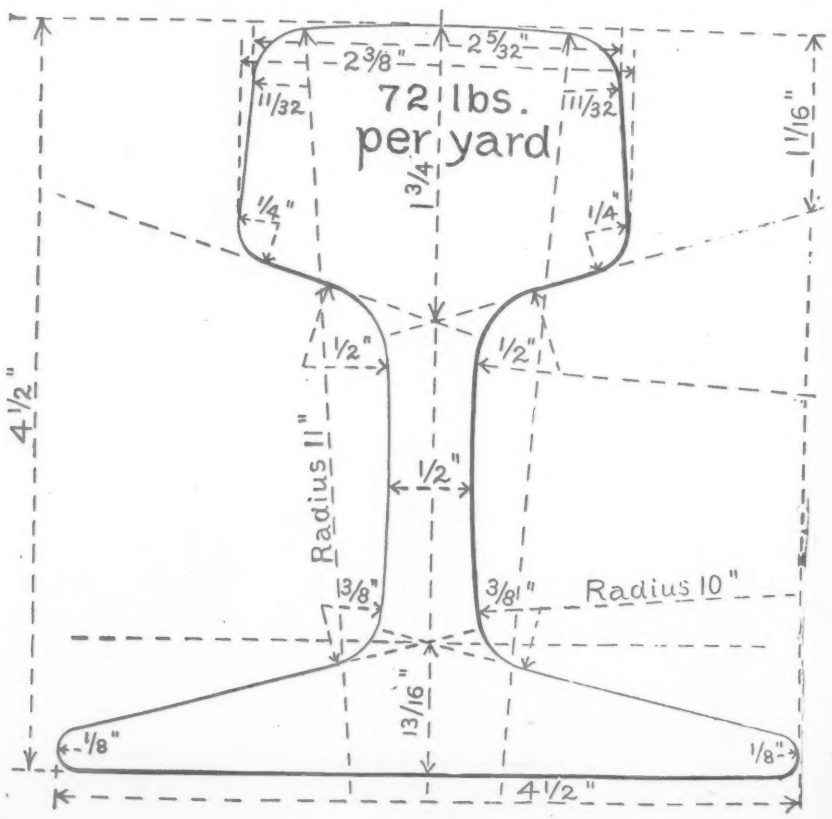












PROPOSED BY MR. A. L. HOLLEY, ENGINEER.

THE WINTER GRAIN MOVEMENT.

This winter there has been such serious obstruction to the railroads that it is not probable that the grain movement has been as large as it would have been with such weather as we had last year, which was perfect, almost, for the carriers. The obstacles, however, have been vastly greater in the West than between the Western grain markets and the East, and in the West, moreover, the weather has hindered free deliveries by the farmers at the local stations, so that we should expect the receipts of the Northwestern markets to be especially affected. Of course these markets can ship only what they receive, but they had considerable accumulations when navigation closed, and under ordinary circumstances they go on accumulating until navigation opens in the spring, so that their shipments might be as great as usual in spite of reduced receipts.

The actual receipts and shipments of the seven reporting Northwestern markets, St. Louis, Peoria, Chicago, Milwaukee, Detroit, Toledo and Cleveland (Duluth reports no receipts in winter), for the three months of December, January and February for the past eight years has been:

	Northwestern.		Atlantic.
	Receipts.	Shipments.	Receipts.
1874	35,098,009	16,494,660	25,336,321
1875	20,242,864	9,452,738	19,524,658
1876	31,594,380	15,138,535	24,550,005
1877	28,337,187	13,404,025	24,775,817
1878	33,280,272	21,570,938	43,392,488
1879	41,426,544	19,180,008	42,270,262
1880	47,600,301	17,633,783	39,477,642
1881	43,718,372	20,959,623	36,533 780

These figures show that the Northwestern receipts for the three months, in spite of the blockades, were but 9 per cent. less than last year, and more than in any previous year. But in spite of a decrease of 3,900,000 bushels in the receipts of these markets, there was an increase of 3,300,000 bushels, or 19 per cent., in their shipments, which were larger than in any other year except 1877-78, when rates were not more than two-thirds of this winter's rates. That is, last winter the receipts of the Northwestern markets for the three months were 30,000,000 bushels more than their shipments; this year they have been 22,800,000 more. That the receipts have not been larger we charge to the snow; that the shipments have been larger is probably to some extent due to the fact that the rates have been one-eighth lower this winter, though some well-informed persons claim that the movement would have been just as great if the rate had been higher.

The receipts of the Atlantic ports this winter are about 7½ per cent. less than last year, and are the smallest for four years, and this in spite of the considerable increase in shipments from the great Northwestern markets. But this is explainable in the same way as the decrease in Northwestern receipts. Of late years a very large portion of the Atlantic receipts have come through directly from interior Western stations, without passing through or being reported at any of these markets. Now the snow has prevented such shipments probably to as great an extent as it has hindered shipments to Chicago, Toledo, etc. Last year the Atlantic receipts for the three months exceeded the Northwestern markets' shipments by 21,844,000 bushels; this year by only 15,574,000 bushels. Exports have been lighter this year, and the receipts of Southern ports have been about as much affected as those of Northern ports, but we think it is safe to say that the whole grain movement would have been considerably greater if there had not been such extraordinary obstruction by snow, which in the Northwest appears to be worse than ever just now, so that the March movement will also be affected by it.

Any reduction in the shipments from such causes, however, can be only temporary; if there is an unusual surplus of grain in farmers' hands in the Northwest it will surely come out, and nearly all of it within the next six months. The Northwestern railroads will get the carrying of it in any event; but if it is not carried in winter, the roads between the West and the East will not carry so much of it and will not get so high rates on what they do carry, so that for them the reduction in the winter movement is a misfortune. They have had, however, a large business, as we see, though not so large as last year, and at lower rates. The reduction has been partly made up by an increase in the flour carried, however.

The receipts at the seven Atlantic ports for these three winter months have been, for five years:

	1876-77.	1877-78.	1878-79.	1879-80.	1880-81.
New York	7,786,962	17,872,293	17,379,704	15,461,199	13,628,686
Boston	3,377,404	3,365,793	3,724,301	3,964,401	5,386 765
Portland	464,109	935,960	645,591	955,349	815,082
Montreal	70,215	51,055	57,867	178,440	146,298
Philadelphia	4,420,200	8,116,410	7,730,850	5,456,610	5,750,850
Baltimore	7,409,944	8,790,500	9,647,400	8,310,517	8,167,050
New Orleans	1,156,983	4,260,477	3,084,549	5,151,126	2,639,069
Total	24,775,817	43,392,488	42,270,262	39,477,642	36,533,780

New York thus has smaller receipts than in any other winter since 1877, but Boston has much larger receipts than ever before; there is a trifling gain at Philadelphia, a trifling loss at Baltimore, and a large loss at New Orleans, which has not received so little grain in the winter since 1877, and which received nearly twice as much last year as this.

Snow and railroad blockades do not account for this. A general railroad blockade would seem to be just what is needed to force grain down the Mississippi, but the New Orleans receipts are hardly half as great as in the open winter last year. And the great blockades by deep snow being commonest in the vicinity of Buffalo and further north, we might suppose that they would reduce New York receipts much more than those of Philadelphia and Baltimore, and Boston receipts most of all. New York receipts, it is true, have been largely reduced, but Boston is the only port of the seven that shows a large *increase* over last winter—36 per cent. in the face of a decrease of 7½ per cent. in the aggregate of the seven ports. Something, apparently, has been working in favor of Boston this winter. We do not know what it is, except as suggested a month ago in our review of the December and January receipts—the Grand Trunk's larger share of Chicago shipments and the Erie's improved Boston connections.

The percentages of the aggregate receipts received at each of the seven ports in the five winters have been:

	1876 77.	1877-78.	1878-79.	1879-80.	1880-81.
New York	31.4	41.2	41.1	39.2	37.3
Boston	13.6	7.8	8.9	10.0	14.8
Portland	1.9	2.2	1.5	2.4	2.2
Montreal	0.3	0.1	0.1	0.4	0.4
Philadelphia	17.9	18.7	18.3	13.8	15.7
Baltimore	30.2	20.2	22.8	21.1	22.4
New Orleans	4.7	9.8	7.3	13.1	7.2
Total	100.0	100.0	100.0	100.0	100.0

New York thus has a smaller proportion of the total than in any previous winter since 1877, and this is true also of New Orleans; Philadelphia has a larger proportion than last winter, but a smaller one than in any of the other three years; Baltimore has a larger proportion than last winter and in 1877-78, but a smaller one than in the other two winters. Boston has a much larger proportion than for three winters before, and a larger one than ever before.

Comparing the percentage of New York with that of Philadelphia and Baltimore taken together, we have:

	1876-77.	1877-78.	1878-79.	1879-80.	1880-81.
New York	31.4	41.2	41.1	39.2	37.3
Philadelphia & Baltimore	48.1	38.9	41.1	34.9	38.1
The three cities	79.5	80.1	82.2	74.1	75.4

The two southern cities together thus have a larger proportion of the whole than New York this year, for the first time since 1877, which, we believe, is the only other winter that this has been true.

Comparing the percentages of New York and Boston taken together with those of Philadelphia and Baltimore together, we have:

	1876-77.	1877-78.	1878-79.	1879-80.	1880-81.
New York and Boston	45.0	49.0	50.0	49.2	52.1
Philadelphia and Baltimore	48.1	38.9	41.1	34.9	38.1
The four cities	93.1	87.9	91.1	84.1	90.2

This makes a different showing. The two northern cities together have never before (in the time covered) had so large a proportion of the grain receipts. And this shows the success of the different competing railroad lines probably better than anything else. The Erie and the New York Central carry almost entirely to New York and Boston; the Pennsylvania chiefly to New York, Philadelphia and Baltimore; the Baltimore & Ohio almost exclusively to Baltimore.

There are thus three notable features in the last winter movement—a considerable decrease in the New York receipts, a large increase in the Boston receipts, and a large decrease in the New Orleans receipts, in a connection with a total decrease of 7½ per cent. in the receipts of the seven ports.

The Chicago & Alton Report.

The Chicago & Alton report for 1880 is the first which covers an entire year of its operation of its own Kansas City line, and its possession of a route between St. Louis and Kansas City, which latter has materially modified its position. This line was opened in May, 1879, and in that year it very largely increased the company's earnings and profits, in spite of a desperate railroad war which signalized its opening and lasted for five months. In 1880 there was generally an increase in traffic in the country the road serves, and on the most important part of it the freight rates were generally well maintained throughout the year, but on the through passenger traffic the rates were badly demoralized for the last two and a half months of the year (and still continue so). Under these circumstances we find an increase of 33.6 per cent. in gross earnings, of 33.2 per cent in working expenses, and of 34 per cent. in net earnings.

The growth of earnings was due partly to an increase in traffic, but partly also to an increase in the average rate on freight. The increase in passenger traffic was no less than 44.4 per cent.—largely due, doubtless, to the very low rates of the railroad war—while the increase in passenger earnings was but 23.9 per cent., the average rate being less, and this not only because of the railroad war, but also in consequence of a general reduction in local rates during the year. There is a separate statement of the local traffic in the report, showing that it increased 39 per cent. A small part of this was affected by the railroad war. The through passenger traffic, which last year was nearly one-third of the whole, increased 56 per cent. All this passenger increase is extraordinarily large, as we noticed in the case of the Illinois Central Railroad recently.

In freight traffic there was an increase of 19.7 per cent., but in freight earnings an increase of no less than 36.9 per cent., which was probably due to the avoidance of the war over freight which in 1879 for five months ruined the value of the traffic between Chicago and Kansas City and St. Louis and Kansas City. The average freight rate increased from 1.054 to 1.206 cents, or 14.4 per cent., and this increase in the rate made a difference of no less than $731,840 in the net as well as the gross earnings, which is nearly one-half of the whole increase in freight earnings, and is 20.2 per cent. of the net earnings. This, then, may be regarded as the advantage of peace over war to this company; *it is equal to nearly 5.4 per cent. on the whole capital stock of the company.*

The increase in expenses was nearly in the same proportion as the increase in receipts, and somewhat greater than the increase in traffic, so that, in spite of the larger traffic, there was a somewhat higher expense per unit of traffic. There was a larger expense per train-mile (98½ instead of 84½ cents), and though the train-loads were larger, the passenger-train load increasing 14.3 per cent. (from 48.7 to 55.6), and the freight-train load 10 per cent. (from 161 to 177 tons), they were not so much larger as the increase in expense (16.6 per cent.) The effect of the passenger war is further seen in the decrease from $1.36 to $1.32 in the average earnings per passenger train-mile; while the freight-train earnings increased from $1.70 to $2.14.

The company's profits last year after meeting all fixed charges amounted to 13 per cent. on the capital stock, but only 8 per cent. was divided.

The increase in expenses was greater for maintenance than for other expenses. In maintenance of way the increase was no less than 45 per cent., and in maintenance of cars 41.7 per cent.

The staples of freight which show the greatest increase in 1880 are wheat, corn, cattle, coal, iron and lumber, in all of which the movement was larger than ever before.

Within the past two years this company has taken a very strong position. It is substantially finished, there being room for a short branch extension in Illinois, and possibly opportunity will occur to build some branches in Missouri. All but a few miles of the main line are laid with steel. A reduction of grades between Bloomington and Chicago, where traffic is heaviest, was completed last year, making the maximum on that division 24 ft. per mile, making it possible to haul much longer trains over it. The bridges are now mostly renewed with iron, and generally the road is put in condition to be worked more cheaply than heretofore. The coal traffic, which is larger on this road than on any other in the West, grows rapidly, and so do the manufacturing industries on the line of the road. The prospect seems good for great and continued prosperity to the company.

Growth of Pig-Iron Production.

The pig-iron production of the United States is reported by Mr. James N. Swank, the Secretary of the American Iron and Steel Association, to have been 4,295,414 tons of 2,000 lbs. in 1880, against 3,070,875 tons in 1879, an increase of no less than *forty per cent.*, which is certainly an extraordinary expansion of a manufacturing industry, and the more so because the production in 1879 was about a fifth larger than in 1878, and larger than ever before. The two great iron-producing states are Pennsylvania and Ohio, Pennsylvania last year making 48.5 per cent. of the whole, and Ohio 15.7 per cent. Then follow New York with 9.2 per cent., New Jersey with 4, Michigan with 3.6, Illinois with 3.5, and Missouri with 2.5 per cent. But the increase in Pennsylvania was not so great in proportion as in most of these other states. While in 1880 it turned out 29.7 per cent. more than in 1879, Ohio produced 50.5 per cent. more, New York 65.4, New Jersey 75.4, Michigan 52.2, Illinois 92.7, and Missouri 95 per cent. more. Since 1876, when the production was the lightest for years, the increase in the aggregate production has been 2,202,173 tons, or 105 per

cent. The amount and percentage of gains in the principal producing states in that time have been:

	1876.	1880.	Increase.	P. c. of Inc.
Pennsylvania	1,009,613	2,083,131	1,073.508	106.4
Ohio	403,277	674,207	270,930	67.9
New York	181,620	395,361	213,741	115.1
New Jersey	25,349	170,049	144,700	571.2
Michigan	95,177	154,424	59,247	62.3
Illinois	54,168	150,556	96,388	178.0
Missouri	68,223	105,555	37,322	54.7

Remembering that the aggregate increase in the whole country in this time was 105 per cent., we see that Pennsylvania has fully maintained its position, but Ohio has not; New York, New Jersey and Illinois have gained more than the average; Michigan and Missouri less. It is interesting to note the progress of states that ten years ago many believed would long before this time be leading producers of pig-iron.

One of these is Missouri, which, as we see, has made less progress than any of the other states mentioned above as leading producers (last year making more than 100,000 tons). Alabama, where many good judges say that the cost of production is less than anywhere else in this country, if not in the world, has truly increased more than 200 per cent. since 1876, from 24,732 to 77,190 tons, and takes the second place after Missouri, but still has a comparatively trifling production. West Virginia, whose resources in the way of raw materials convenient to be brought together are said to be similar to those of Western Pennsylvania, has increased from 41,165 to 70,338 tons, or 80.8 per cent.—less than the average. Moreover, it shows no increase from 1879 to 1880, which, considering the great demand, is surprising. Tennessee stands next to Alabama in production (in 1880) and has increased 188 per cent. since 1876.

Taking the country in three great divisions, in which the states north of the Potomac and east of Ohio are called the East, those south of the Potomac, the Ohio and the state of Missouri the South, and the rest the West, we find the following progress from 1876 to 1880:

	1880.	1876.	Increase.	P. c.
The East	2,756,946	1,255,210	1,501,736	120.0
The South	335,864	149,558	186,306	124 2
The West	1,202,604	688,468	514,136	74.7

Thus the increase in the South since 1876 has been at a little faster rate than in the East; but in the West the increase has been much slower.

The production west of the Mississippi, with the exception of that in Missouri, was and remains insignificant. Including Missouri (and Texas) it was 70,464 tons in 1876 and 113,055 in 1880; excluding Missouri 2,241 in 1876 and 11,020 in 1880. The extensive works under construction in Colorado now will doubtless change this greatly. That state has not till this year produced any iron, but the furnaces connected with the new Bessemer works there will probably hereafter largely supply the demand of the great far western interior, because of the great saving in freight.

The production of pig-iron has a special interest to the railroads because of the enormous freightage connected with it—ore, coal and limestone going to the furnaces and the distribution of the iron afterwards. In most cases, however, it is necessary to make very low rates on all this transportation, and frequently a railroad counts little on this traffic for profit, but expects it rather from the traffic in passengers and supplies which is created by the springing up of an industry employing many men.

Locomotive Manufacturing in this Country.

The condition of this branch of business in this country at the present time is indicated by the following correspondence. The facts attending it were these: The President of a railroad requested an engineer to learn how soon, and at what price, he could have twelve engines built. A copy, substantially, of the following letter was sent to each of the manufacturers of locomotives in this country:

"How soon can your firm build six eight-wheeled and six ten-wheeled locomotives? If you can deliver them early enough, drawings and specifications will be sent you to estimate on."

It may be added that this was a *bona fide* request, and that although the engines have not yet been contracted for, they no doubt will be within a short time.

The following are extracts from the replies received from the locomotive-building firms and companies, which are designated by letters of alphabet, their names being withheld:

(*a.*) "Our engagements are such that we could not deliver any of the engines mentioned in less than twelve months."

(*b.*) "We can deliver engines in December, but are full up to that time. You may prepare your client's mind for a decided advance in price."

(*c.*) "We regret not being in a condition to furnish the engines, but we have already more locomotives contracted for than we can possibly build this year, and have turned away or refused numerous applications for engines, considering it unwise to make contracts so far in the future."

(*d.*) "Our engagements are such that we could not deliver before January next."

(*e.*) "We can do nothing for you this year, as our production has all been taken, and we are not yet quoting prices for delivery in 1882."

(*f.*) "We could not book orders for engines for delivery till some time next year, dependent somewhat on result of tenders now out."

(*g.*) "We are full a long way ahead now, and that would of necessity throw the deliveries of such an order as this so far into the future that you would very likely not entertain it, and we are not anxious to bid on so distant dates."

(*h.*) "We cannot take further orders for locomotives to be delivered in 1881."

(*i.*) "We would be glad to build the engines you inquire about, but cannot name earlier than February and March, 1882, for delivery."

(*j.*) "We are full of work for more than a year ahead, and cannot offer delivery of the twelve locomotives mentioned earlier than April, 1882."

(*k.*) "We can do nothing for you in the matter of delivery before June, 1882."

(*l.*) "We cannot build the engines before December next."

(*m.*) "With the contracts we now have on hand, it is impossible for us to build the locomotives you require before February, 1882."

(*n.*) "We would not undertake the contract, as it is impossible for us to deliver them within any reasonable time."

(*o.*) "We thank you for the inquiry, but we have to say that we could not deliver the engines you name February, 1882. We are full of orders till that time."

The extracts are from letters received from all the locomotive manufacturing establishments in the country excepting one which is engaged exclusively in making mining and light locomotives.

Record of New Railroad Construction.

This number of the *Railroad Gazette* contains information of the laying of track on new railroads as follows:

Detroit, Lansing & Northern.—The *Fish Creek Branch* is completed from near Colby, Mich., to Fish Creek, 5 miles.

Atlantic & Pacific.—Extended westward to Crane's Ranch, N. M., 19½ miles.

Texas & Pacific.—The *Transcontinental* Division is extended from Whitesboro, Tex., south by west to Pilot Point, 30 miles.

This is a total of 54½ miles of new railroad, making 254 miles reported thus far this year, against 575 miles reported at the same time in 1880, and 141 miles in 1879.

THE SEVERE WINTER, now that it is about over, begins to affect speculators in the stock market, who are generally two or three months behind the times in appreciating the facts which actually have a bearing on the value of the securities in which they deal. And this is shown even now, because it is the falling-off in earnings that is appreciated, and not the increase in expenses. Now the reduction of earnings by a snow blockade is comparatively an insignificant thing. Doubtless on several roads earnings for certain weeks and months have been much reduced by these interruptions; but most of these (and especially the Northwestern roads, which have suffered most from snow) will carry nearly as much, taking the year through, as if there had been no snow. The grain and stock on the farms will go to market after the snow is gone, if it cannot before, and the lumber and supplies will go just about the same as if there had been no snow. The serious phase of the matter, however, is the increase of expenses, which on many roads that have hardly been blocked at all has been very great, to say nothing of those where extra force is employed to keep the tracks clean; the snow which does not prevent trains from running does so increase the resistance that fewer cars can be hauled in a train—sometimes not more than half as many on certain sections; the obstructed road increases the shocks and jerks and strains of rolling stock, and breakages and accidents are enormously increased, compelling extraordinarily large expenditures for maintenance of equipment. Though the train is smaller, the engine burns more fuel in cold weather. Now all these unusual expenditures are made when traffic is smaller, or even altogether interrupted. And the effect of the winter will be felt a long time after it is over, in repairs to be made to road and rolling stock. It is safe to say that the severe weather this winter has cost the railroads in the aggregate millions of dollars, and in many cases where gross earnings have fallen off little if any, or even have increased, the net earnings must have been very much less than last year. Last year, however, the winter profits were extraordinarily large—heavy traffic, good rates, and unexceptionable weather contributing thereto.

JUDGE BLACK'S SPEECH TO THE ANTI-MONOPOLY LEAGUE, on which we made some comments two weeks ago, designed to show the gross extravagance of some of its statements, is being answered by Mr. Albert Fink in a series of articles in the New York *World*, two of which have already appeared. Judge Black's speech and his letter, written previously to the Chamber of Commerce Committee, were very widely circulated, and the extravagant statements made in them were just what strike the public mind and are remembered, and it was therefore especially important that they should be answered publicly, with irrefragable facts and figures, as Mr. Fink is doing. A summary of the first of his letters was very widely puplished in the newspapers of the country, and every one who reads it must be convinced of the utter ignorance of Judge Black of the matter concerning which he assumed to inform the people.

General Railroad News.

MEETINGS AND ANNOUNCEMENTS.

Dividends.

Dividends have been declared as follows:

Lehigh Valley, 1½ per cent., quarterly, payable April 16. This company increases from 1 to 1½ per cent.

New York & Harlem, 3 per cent., from the earnings of the city line, payable April 1. This is in addition to the 8 per cent. paid by the lessee.

New York Central & Hudson River, 2 per cent., quarterly, payable April 15.

Western Union Telegraph, 1½ per cent., quarterly, payable April 1.

Union Pacific, 1¾ per cent., quarterly, payable April 1. This company increases from 1½ to 1¾ per cent.

Dubuque & Sioux City (leased to Illinois Central), 2½ per cent., semi-annual, payable April 15.

National Association General Passenger & Ticket Agents.

The semi-annual convention of this Association met in New York March 9, with a full attendance. President W. B. Shattuc occupied the chair, with Mr. A. J. Smith as Secretary. Several new members were enrolled.

On the first day the next meeting was fixed for the third Tuesday in September at St. Louis. The convention discussed the project of increased charges for excess of baggage. The present rate is 10 per cent. on the price of passage on all baggage in excess of 150 pounds, and a motion to increase the charge to 15 per cent. was voted down. The matter of reduced rates to the Yorktown centennial was referred to a special committee. It was decided not to make any general revision of the passenger tariff, and the committee on Revision of Rates were so instructed. At the afternoon session the convention discussed the question of reduced rates for the Sunday School Convention at Toronto, the Colton Convention at Atlanta, and the coming Saengerfests at Chicago and St. Louis. It was determined to make the reductions only on local rates to and from these points and not on the through rates. At 5 p. m. the convention adjourned for the day. Before dispersing, each member was presented with a beautiful silk badge and a working model of the obelisk as a memento of his visit to New York. The evening was spent in social intercourse.

ELECTIONS AND APPOINTMENTS.

Boston & Lowell.—Mr. Arthur A. Hobart, having resigned his position as Superintendent, the vacancy will not be filled at present. Mr. J. F. Crockett, Master Mechanic, is appointed Master of Transportation also, and will have charge of the movement of all trains, as well as of the motive power, shops and machinery.

Chicago & Alton.—Mr. W. W. Lord, Jr., is appointed Southeastern Passenger Agent, with office at Harrisburg, Pa., in place of P. P. Young, resigned. Mr. A. D. Perry succeeds Mr. Lord as Traveling Passenger Agent.

Chicago & Grand Trunk.—Mr. Charles B. Peck, General Manager, has issued a circular informing connecting lines that until further notice he will perform the duties of General Freight Agent and General Ticket Agent of the Chicago & Grand Trunk, Mr. L. E. Snively, General Freight Agent, and Mr. W. E. Davis, General Ticket Agent, having resigned.

Cleveland, Columbus, Cincinnati & Indianapolis.—At the annual meeting in Cleveland last week, the directors (one third of the board), whose terms then expired, were re-elected, as follows: James Barnett, Walton Ferguson, T. P. Handy, Amos Townsend.

The full board is now as follows: S. Burke, James Barnett, J. H. Devereux, T. P. Handy, H. B. Hurlbut, George H. Russell, Amos Townsend, Cleveland, O.; B. S. Brown, Columbus, O.; Herman R. Baltzer, A. G. Dulman, Walton Ferguson, Hugh J. Jewett, James R. Keene, New York.

Grand Junction.—At the recent annual meeting the following officers were chosen: President, Thomas Kelso; Vice-President, John McDougall; Managing Director, E. O. Bickford. Office in Belleville, Ontario.

Jeffersonville, Madison & Indianapolis.—Mr. M. Kirby is appointed Assistant Superintendent of Maintenance of way, in place of Wm. Redman, resigned.

Joliet & Valparaiso.—At the annual meeting recently the following officers were chosen: President, Charles H. Gould; Vice-President, H. N. Marsh; Secretary, Charles H. Weeks; Treasurer, Conrad Tatge.

Kansas City, St. Louis & Chicago.—At the annual meeting last week the following directors were chosen: John J. Mitchell, M. Reed, P. H. Rea, Thomas Shackelford, M. Higgins, George Straut, John M. Woodson, W. H. Medill. The road is leased to the Chicago & Alton.

Lehigh Valley.—Mr. W. Charles Alderson has been appointed Assistant Treasurer and Assistant Purchasing Agent.

Memphis & Kansas City.—This company has been orgarized by the election of the following officers: President, Louis Hanaver; Vice-President, John A. Lindsey; Secretary, R. F. Patterson; Treasurer, Henry Boas. The President and Secretary have their offices in Memphis, Tenn.

New York & Atlantic.—The directors of this company are as follows: Daniel Butterfield, E. B. Dorsey, G. G. Frelinghuysen, Henry H. Hall, Jesse Johnson, James Jourdan, Thales Lindsey, Thomas Proctor, Moses Taylor Pyne, J. Fisher Satterthwaite, John Sickles, Charles L. Snow, Arthur D. Vinton. The officers are: President, Daniel Butterfield; Treasurer, John Sickles; Chief Engineer, Charles L. Snow.

New York & Chicago.—The officers and directors of this new company are as follows: President, C. S. Brice; Vice-President, Wm. Fleming; Treasurer, Samuel Thomas; Secretary, James E. Neal; directors, C. S. Brice, Samuel Thomas, George I. Seney, Walston H. Brown, C. R. Cummings, W. B. Howard, Wm. Fleming, James E. Neal, J. A. Latcher.

New York City & Northern.—Messrs. C. K. Garrison, W. R. Garrison, Arthur Leary, J. P. Kennedy, George J. Forrest and Calvin Goddard have been chosen directors, in place of C. F. Woerishoffer, Lewis May, R. M. Gallaway, J. F. de Navarro, G. P. Lowrey and A. Hegewisch, resigned.

New York, Ontario & Western.—The organization of this company has been completed with the following appointments: Edward F. Winslow, President; Theodore Houston, Vice-President; Conrad N. Jordan, Treasurer; John L. Nisbet, Secretary and Assistant Treasurer; S. A. Lathrop, Auditor; Walter Katte, Chief Engineer; James E. Childs, General Superintendent; B. W. Thatcher, General Freight and Passenger Agent.

The office of the General Superintendent is at Middletown, N. Y. All other offices are located at No. 20 Nassau street, New York.

New York, Pennsylvania & Ohio.—Under the organization of this company the directors are to be elected by "voting trustees," as those of the Erie are, and these voting trustees are chosen, not by the stockholders, but by certain classes of the bondholders. The scheme provides for five, of whom the first-mortgage bondholders elect three, the second-mortgage bondholders one, and the leased line rental trust bondholders one. At the first meeting in London, Feb. 10, Sir George Balfour, Rev. J. Lockington Bates and Hon. H. Cecil Raikes (late Chairman of the House of Commons) were chosen by the first-mortgage bondholders, and Mr. C. E. Lewis by both the second-mortgage and the leased line bondholders. These, with the exception of Mr. Raikes, were the reorganization trustees.

Pennsylvania.—Mr. F. J. McWade has been appointed General Baggage Agent, in place of Charles R. Clement, deceased. Mr. McWade has been on the Pennsylvania for many years, and for about a year past has been Assistant General Ticket Agent of the West Jersey road.

Pennsylvania Company.—Mr. E. A. Ford is appointed General Passenger and Ticket Agent of all this company's

lines. Mr. Ford is well known as an active and able officer. He was formerly on the Missouri Pacific, and for some time past has been General Passenger Agent of the Vandalia Line.

Pittsburgh Rapid Transit Co.—This company has been organized at Pittsburgh, Pa., with the following officers: President, James S. Andrews; directors, Simon Baymer, D. W. C. Carroll, A. G. Cochran, James H. Hopkins, F. B. Laughlin, M. K. Moorhead, Wm. Rea, Wm. Vankirk; Secretary, Wm. McClelland; Treasurer, Wm E. Schmertz.

Rock Island & Peoria.—Mr. H. B. Sudlow has been appointed Assistant Superintendent, with office in Rock Island, Ill. He will have immediate charge of the road under supervision of General Superintendent Cable.

Sinaloa & Durango.—The directors of this new company are: R. R. Symon, Culiacan, Mexico; E. L. Davis, Worcester, Mass.; J. H. Brooks, Milton, Mass.; W. H. Hill, Jr., Brookline, Mass.; W. S. Blanchard, J. S. Cumston, P. M. Hart, C. W. Pierce, S. W. Richardson, Boston.

Union Pacific.—At the annual meeting in New York, March 9, the following directors were chosen: John Sharp, Salt Lake, Utah; S. H. H. Clark, Omaha, Neb.; Granville M. Dodge, Council Bluffs, Ia.; Wm. L. Scott, Erie, Pa.; Frederick L. Ames, South Easton, Mass.; Elisha Atkins, F. Gordon Dexter, Boston; Sidney Dillon, Thomas T. Eckert, Jay Gould, Solon Humphreys, David Dows, Russell Sage, Augustus Schell, New York. Mr. Schell is a new director, representing the Vanderbilt interest. The board re-elected Sidney Dillon, President; Elisha Atkins, Vice-President; Henry McFarland, Secretary and Treasurer; A. H. Calef, Assistant Secretary; James M. Ham, Assistant Treasurer.

Virginia Midland.—It is reported that Mr. B. Dunham has been offered and accepted the position of General Manager of this road. He has been for some years past Division Superintendent of the Louisville & Nashville, and before that, we believe, was on the Montgomery & Eufaula.

Wabash, St. Louis & Pacific.—At the annual meeting in St. Louis, March 8, the following directors (one-third of the board) were chosen: Thomas E. Tutt, James F. How, St. Louis; James Cheney, Ft. Wayne, Ind.; George G. Haven, Samuel Sloan, New York. Messrs. Haven and Sloan are new directors; the others are re-elected.

West Jersey.—Mr. J. L. Hackett has been appointed Assistant General Ticket Agent, in place of F. J. McWade, who has gone to the Pennsylvania road.

PERSONAL.

—Mr. George T. Nutter has resigned his position as Traffic Manager of the Indianapolis, Decatur & Springfield Railroad.

—Mr. Wm. Redman has resigned his position as Assistant Superintendent of Maintenance of Way on the Jeffersonville, Madison & Indianapolis road.

—Mr. Franklin B. Gowen, President and Receiver of the Philadelphia & Reading Company, has returned from his trip to England, having arrived in New York on March 5.

—Mr. H. Victor Newcomb, recently President and still director of the Louisville & Nashville Company, is now President of the new United States National Bank in New York.

—Mr. G. Clinton Gardner has tendered his resignation as Manager of the Troy & Greenfield Railroad, to take effect April 1. It has not yet been acted on by the Governor and Council of Massachusetts.

—Mr. Robert T. Lincoln, the new Secretary of War, represented the Pullman Palace Car Company before the Illinois Legislature a few weeks ago, in opposition to a bill to regulate the charges in sleeping cars.

—Mr. Frank R. Myers, for a long time General Passenger and Ticket Agent of the Pittsburgh, Ft. Wayne & Chicago, has resigned his position, and will soon go to Europe with his family for needed rest and recreation.

—Hon. Wm. Windom, the new Secretary of the Treasury, was for some time Chairman of the Senate Special Committee on Transportation Routes to the Seaboard, and has given much attention to railroads while in the Senate.

—Mr. T. A. Brooks, for a long time Master Carpenter of the New York Division of the Pennsylvania Railroad, was struck by a locomotive near Trenton, N. J., where he was inspecting some work, on March 4, and instantly killed.

—Judge James Wilson McDill, one of the Iowa Railroad Commissioners (a body, by the way, that has done unusually good work) has been appointed United States Senator in place of Mr. Kirkwood, the new Secretary of the Interior.

—Mr. Fred. H. Smith, of the Baltimore Bridge Co., has been compelled by ill health to close his office in Baltimore and give up work for a time. He will probably go to the Arkansas Hot Springs shortly, in hopes of receiving benefit.

—Hon. Wayne McVeagh, just appointed Attorney-General of the United States, has had much experience in railroad and corporation business. He was at one time director of the Northern Central, and has been attorney for that company and the Pennsylvania.

—Mr. A. M. Wellington, well known as an engineer and author of several works on engineering subjects, sailed from New York March 10 for Mexico, where he will have charge of location on the Mexican National road. His headquarters will be in the City of Mexico for the present.

—Mr. Arthur A. Hobart has resigned his position as Superintendent of the Boston & Lowell road. Mr. Hobart served on the Chicago & Northwestern, the Chicago, Burlington & Quincy and the Troy & Boston before going to the Lowell road, and has acquired much reputation as a skillful manager of trains.

—Mr. Galloway Cheston, an old and wealthy merchant of Baltimore, and for many years a director of the Baltimore & Ohio Company, died March 9, aged 75 years. He was a member of the Society of Friends, and was prominently connected with many of the charitable institutions of Baltimore. He was President of the board of trustees of the Johns Hopkins University.

—Mr. L. B. Boomer, of Chicago, died suddenly March 6, at the Windsor Hotel, New York, where he was on some business. Mr. Boomer has been widely known for many years as an engineer and bridge-builder, and has been connected with the construction of many important bridges. He was President of the American Bridge Co., and since its failure has been in business in Chicago.

—Mr. Edward Studley, Master Mechanic of the Buffalo Division, Lake Shore & Michigan Southern road, having resigned, the employés recently presented him with a very handsome testimonial, consisting of a complimentary address, handsomely engrossed and framed, with a drawing of a locomotive designed and built by him. Mr. Studley goes out of railroad business altogether, and will live in Concord, N. H.

—Mr. Wm. J. Nicolls, formerly Engineer of the Long Island Railroad, and lately Chief Engineer of the Danville, Mocksville & Southwestern, has accepted a position as General Manager of an extensive coal-mining and railroad interest in Centre County, Pa., near Snow Shoe. He will have charge of the opening and development of the property. Mr. Nicolls' address is Bush House, Bellefonte, Centre County, Pa., for the present.

—At the annual meeting of the Pennsylvania Railroad stockholders, March 8, the following resolutions were unaninously adopted:

"*Whereas*, Since our last meeting Mr. Thomas A. Scott, our former President, has, under the advice of his physician, felt constrained to retire from active participation in the management of the company; and, whereas, our board of directors has placed upon record its testimony to his eminent services during 30 years' connection with our property; therefore, be it

"*Resolved*, By the stockholders of the Pennsylvania Railroad Company in annual meeting assembled, that we cordially endorse the action of the board, but we also desire to express our high appreciation of the able and valuable services of Mr. Thomas A. Scott to the company during his long and arduous employment in its behalf, and more especially to the courage and untiring devotion displayed when popular turbulence threatened destruction to our property, which services unfortunately contributed to impairing his health and depriving us of his skill and vast experience.

"*Resolved*, That we sincerely hope that our loss may be his gain, and that restored health and many years of rest and happiness may be the reward of an active life spent in our interest and in the development of kindred enterprises to the great benefit of the entire country."

TRAFFIC AND EARNINGS.

Railroad Earnings.

Earnings for various periods are reported as follows:

	1880.	1879.	Inc. or Dec.	P. c.
Month of December:				
St. John & Maine..	$9,900	$8,864	I. $1,036	11.6
Net earn...	1,984	1,710	I. 274	16.1
Two months ending Feb. 28:				
	1881.	1880.		
Central Pacific....	$3,002,008	$2,271,101	I. $731,807	32.2
Chi. & Alton.....	949,531	1,021,068	D. 71,537	7.0
Chi. & Eastern Ill..	241,851	155.731	I. 86,120	55.2
Chi., Mil. & St. P...	1,674,000	1,503,047	I. 170,953	11.4
Chi. & N. W.....	2,197,967	2,286,316	D. 88,349	3.8
Cin., Ind., St. L. & C.....	332,447	328,238	I. 4,209	1.3
Cin. & Springf.....	145,107	132,656	I. 12,451	9.5
Cleve., Col., Cin. & Ind.....	571,079	604,564	D. 33,485	5.4
Cleve., Mt. Ver. & Del.....	62,069	68,803	D. 6,734	9.8
Denver & R. G.....	625,157	253,184	I. 371,973	147.0
E. Tenn., Va. & Ga.	219,269	215,761	I. 3,508	1.5
Grand Trunk.....	1,535,896	1,490,981	I. 44,915	3.0
Great Western.....	727,021	685,252	I. 41,789	6.1
Hann. & St. Jo.....	279,180	343,044	D. 63,864	18.6
Houston & Texas Cent.....	685,341	591,832	I. 93,509	5.7
Ill. Cent., Ill. lines..	899,034	954,718	D. 55,684	5.8
Iowa lines.....	194,289	253,721	D. 59,432	23.4
Int. & Gt. No..... ..	392,080	299,757	I. 92,329	30.8
Lake Erie & West..	193,663	108,283	I. 85,380	79.0
Louis. & Nashv.....	1,611,500	1,249,490	I. 362,010	29.0
Memphis & Charleston.....	231,892	231,517	I. 375	0.2
Mobile & Ohio	429,596	454,210	D. 24,614	5.4
Northern Pacific....	193,826	158,649	I. 35,177	22.1
St. L., A. & T. H., Main Line.....	211,532	205,910	I. 5,622	2.7
St. L., Iron Mt. & So.....	1,119,257	1,046,178	I. 73,079	7.0
St. L. & San Fran..	390,669	395,339	D. 4,670	1.2
Texas & Pacific	514,428	457,428	I. 57,000	12.4
Wabash, St. L. & P.	1,630,539	1,861,756	D. 231,217	12.4
Month of January:				
N. Y. & N. England.	$189,750	.....	.....	....
Net earnings.....	32,265	.....	.....	....
N. Y., Penna. & O..	421,908	$412,365	I. $9,543	2.3
Month of February:				
Central Pacific....	$1,400,000	$1,070,487	I. $329,513	30.8
Chi. & Alton.....	461,641	497,013	D. 35,372	7.2
Chi. & Eastern Ill..	116,396	83,265	I. 33,131	39.8
Chi., Mil. & St. P...	683,000	738,749	D. 55,749	7.5
Chi. & N. W.....	957,300	1,131,683	D. 174,383	13.6
Cin., Ind., St. L. & Chi.....	160,981	172,541	D. 11,960	6.9
Cin. & Springfield..	70,574	62,757	I. 7,817	12.4
Cleve., Col., Cin. & Ind.....	271,176	291,931	D. 20,785	7.0
Cleve., Mt. Ver. & Del.....	29,550	34,612	D. 5,062	14.5
Denver & R. G.....	317,681	128,291	I. 189,390	147.9
E. Tenn., Va. & Ga.	110,752	104,696	I. 6,056	5.8
Hann. & St. Jo.....	126,113	166,965	D. 40,852	24.5
Houston & Tex. Cent.....	325,635	272,791	I. 52,844	19.3
Ill. Cent., Ill. lines .	421,235	487,269	D. 66,034	13.6
Iowa lines... ...	71,616	126,537	D. 54,921	43.3
Int. & Gt. No.....	210,623	140,214	I. 70,409	50.3
Lake Erie & Western..	88,485	58,789	I. 29,696	50.4
Louisville & Nash..	803,490	575,035	I. 228,455	39.7
Mem. & Charleston.	111,050	102,252	I. 7,798	7.6
Mobile & Ohio.....	211,353	204,094	I. 7,259	3.6
Northern Pacific...	79,976	77,259	I. 2,717	3.5
St. L., A. & T. H., Main Line.....	109,758	108,988	I. 770	0.7
St. L., Iron Mt. & So	548,300	493,195	I. 58,105	11.9
St. L. & San Francisco.....	178,234	199,644	D. 21,410	10.7
Scioto Valley,.....	22,917	20,352	I. 2,565	12.8
Wabash, St. L. & P.	818,922	933,143	D. 114,221	11.1
Two weeks in February:				
Gal., Har. & San Antonio	$54,928	$42,960	I. $11,968	27.8
First week in March:				
Northern Pacific...	$26,952	$23,960	I. $2,992	12.5
Week ending Feb. 25:				
Great Western.....	$94,913	$90,057	I. $4,856	5.4
Week ending Feb. 26:				
Grand Trunk.....	$210,782	$200,740	I. $10,042	5.0

Grain Movement.

For the week ending Feb. 26 receipts and shipments of grain of all kinds at the eight reporting Northwestern markets and receipts at the seven Atlantic ports have been, in bushels, for the past eight years:

Year.	Northwestern receipts.	Northwestern shipments.	Atlantic receipts.
1874.....	1,816,223	739,470	1,419,435
1875.....	1,621,938	474,689	1,273,274
1876.....	3,182,506	1,936,225	2,515,071
1877.....	2,555,959	1,315,110	2,375,036
1878.....	2,479,460	1,953,115	3,689,356
1879.....	3,390,562	1,727,475	4,389,067
1880.....	3,943,472	2,320,154	3,926,011
1881.....	2,391,492	1,686,909	3,427,219

The receipts of the Northwestern markets are smaller than in any corresponding week since 1875, yet nearly twice as great as the previous week. The weather has made these receipts entirely abnormal. The shipments are smaller than in the corresponding week of the three years next previous, but they are the largest for six weeks this year. The Atlantic receipts are large, and the largest for eleven weeks, but smaller than in the corresponding weeks for three years previous.

Of the Northwestern receipts Chicago had 36 per cent., St. Louis 27.3, Peoria 15.8, Milwaukee 10.6, Detroit 5.3, Cleveland 2.9, and Toledo 2.1 per cent.

Of the Atlantic receipts New York had 35.3 per cent., Baltimore 21.3, Philadelphia 16.3, Boston 12.6, New Orleans 12.6, Portland 1.8, and Montreal 0.1 per cent.

Exports of grain and flour from the seven Atlantic ports for five successive weeks have been:

	Week ending Mar. 2.	Feb. 23.	Feb. 16.	Feb. 9.	Feb. 2.
Flour, bbls.	114,946	111,022	120,932	89,284	123,920
Grain, bush.	2,808,277	1,758,010	2,476,801	2,104,050	2,029,828

The grain exports for the last week are the largest for many weeks.

From Jan. 1 to Feb. 26 exports of flour, in barrels, and wheat and corn in bushels from four leading Atlantic ports were:

	1881.	1880.	Inc. or Dec.	P. c.
Flour:				
New York.....	984,107	537,166	I. 446,941	83.1
Boston.....	165,002	132,972	I. 32,030	24.1
Baltimore.....	85,710	41,277	I. 44,433	107.6
Philadelphia.....	26,108	18,242	I. 7,866	43.1
Wheat:				
New York.....	5,156,593	4,316,154	I. 840,439	19.0
Boston.....	418,914	674,708	D. 255,794	37.9
Philadelphia.....	925,019	383,627	I. 541,392	141.2
Baltimore.....	2,557,248	2,451,142	I. 93,894	3.8
Corn:				
New York.....	2,047,478	3,719,607	D. 1,672,129	45.0
Boston.....	1,144,557	1,234,546	D. 89,989	7.3
Philadelphia.....	681,595	1,855,965	D. 1,174,370	63.3
Baltimore.....	1,564,351	3,054,632	D. 1,490,281	48.8

There was a very large gain in flour exports, but New York had nearly four-fifths of these, and New York and Boston together more than nine-tenths of these.

There is a considerable increase in the wheat exports, which has been at New York and Philadelphia chiefly, and everywhere a large decrease in corn, amounting in the aggregate to 55 per cent.

Receipts of grain and flour at Chicago and Milwaukee from Jan. 1 to March 4 (nine weeks) have been:

	1881.	1880.	Inc. or Dec.	P. c.
Chicago:				
Flour, bbls.....	992,491	448,260	I. 544,231	121.4
Grain, bush..	10,411,445	13,493,575	D. 3,082,132	22.8
Milwaukee:				
Flour, bbls.....	524,941	279,400	I. 245,541	88.0
Grain, bush.....	2,364,148	3,001,210	D. 637,062	21.2

At Chicago the increase in flour receipts does not quite make up for the large decrease in grain receipts; but at Milwaukee the increase in flour is nearly twice the decrease in grain. Taking the two cities together there is a decrease of 3,719,194 bushels of grain, while the increase in flour is equivalent to 3,553,974 bushels of wheat in value as bread stuff, but to only 2,632,573 bushels in receipt of freight.

The shipments of these cities for the same period were:

	1881.	1880.	Inc. or Dec.	P. c.
Chicago:				
Flour, bbls.	979,656	388,537	I. 591,119	152.0
Grain, bush.....	9,351,780	7,192,344	I. 2,159,436	30.0
Milwaukee:				
Flour, bbls.....	579,401	309,580	I. 269,821	87.1
Grain, bush... .	1,028,720	852,500	I. 176,220	20.7

Thus there has been a considerable increase in the grain shipments as well as a very large one in the flour shipments. The accumulations of grain in the elevators have been very much smaller than last year, as witness the following statement of the excess of receipts over shipments in the two years:

	1881.	1880.	Decrease.	P.c
Chicago.....	1,059,663	6,301,231	5,241,568	83.2
Milwaukee.....	1,335,428	2,148,710	813,282	37.8
Both.....	2,395,091	8,449,941	6,054,850	71.7

The best winter railroad policy is that which, so far as possible, carries away the grain from lake ports as fast as it arrives, provided this can be done at remunerative rates. For if the grain is left till navigation opens the lake vessels will get the greater part of it, and the railroads will get considerably less than winter rates on the part they do carry. Certainly the roads have come much nearer such a policy this year than last. They carried from Chicago in January and February nine-tenths of the grain arriving there this year, against but little more than half of it (53 per cent.) last year; and from the two ports they carried four-fifths of the receipts this year, against less than half last year.

Coal Movement.

Anthracite tonnages for the two months ending Feb. 26 are reported as follows, the tonnage in each case being only that originating on the line to which it is credited:

	1881.	1880.	Inc or Dec.	P.c.
Philadelphia & Reading...	805,494	706,724	I. 98,770	14 0
Northern Central, Shamokin Div. and Summit Branch R. R	153,633	69,742	I. 80,891	115.6
Sunbury, Hazleton & Wilkesbarre	673	6,341	D. 5,665	89.8
Central of N. J., Lehigh Division	513,295	459,230	I. 54,065	11.8
Lehigh Valley.....	761,034	552,645	I. 208,389	37.7
Pennsylvania & N. Y....	5,788	1,632	I. 4,156	254.7
Del., Lacka. & Western.	601,435	511,336	I. 90,099	17.6
Del. & Hudson Canal Co.	511,421	511,414	I. 7	....
Pennsylvania Coal Co...	154,646	89,862	I. 64,784	72.0
State Line & Sullivan....	9,460	7,011	I. 2,449	35.0
Total anthracite.....	3,516,882	2,915,037	I. 600,945	20.6

The tonnage of anthracite for the corresponding period for six years has been:

1881.....	3,516,882	1878	2,026,446
1880.....	3,915,037	1877.....	2,279,210
1879.....	2,956,412	1876	2,528,804

For the fiscal year ending Nov. 30 the actual tonnage carried over the Pennsylvania & New York road was as follows:

	1880.	1879.	Inc. or Dec.	P. c.
Anthracite.....	785,464	860,162	D. 154,698	18.0
Bituminous.....	435,517	329,901	I. 105,616	32.0
Total.....	1,140,981	1,190,063	D. 49,082	4.1

Of the anthracite last year 48,618 tons were received from State Line & Sullivan roads; the rest came from below Pittston. Of the bituminous 217,975 tons were from Towanda Coal Co., 216,456 from Schraeder Coal Co. and 1,086 from Northern Central road.

Actual tonnage of anthracite over the Pennsylvania & New York road for the three months from Dec. 1 to Feb. 26 was: 1881, 172,771; 1880, 168,951; increase, 2,820 tons, or 2.2 per cent.

Semi-bituminous tonnages reported for the two months were as follows:

	1881.	1880.	Inc. or Dec.	P. c.
Cumberland.....	209,539	271,584	D. 62,045	22.8
Huntingdon & Broad Top ..	37,153	31,444	I. 5,709	18.4
East Broad Top.....	10,940	7,431	I. 3,509	47.5
Tyrone & Clearfield.....	275,549	329,776	D. 45,227	14.1
Bellefonte & Snow Shoe.....	8,243	10,441	D. 2,198	21.1
Total semi-bituminous.	541,444	641,696	D. 100,252	15.6

The figures for Cumberland coal given above are the ship-

ments over the Cumberland & Pennsylvania road and Cumberland Branch from the mines; shipments away from Cumberland were:

	1881.	1880.	Decrease.	P. c.
By Balt. & Ohio R. R.	172,982	229,221	56,329	24.5
By Bedford Div., Pa. R. R.	24,642	27,785	3,133	11.2
By Ches. & Ohio Canal	.....	2,583	2,583	100.0
Total	197,534	259,579	62,045	23.9

Actual tonnage passing over the Huntingdon & Broad Top road for the two months was:

	1881.	1880.	Inc. or Dec.	P. c.
Broad Top coal	37,153	31,444	I. 5,709	18.4
Cumberland coal	29,568	30,368	D. 800	2.8
Total	66,721	61,812	I. 4,909	7.9

Bituminous tonnages reported for the two months are:

	1881.	1880.	Inc. or Dec.	P. c.
Barclay R. R. & Coal Co.	76,899	69,514	I. 7,385	10 5
Allegheny Region, Penn. R. R.	42,551	45,571	D. 3,020	6.6
Penn and Westmoreland	143,017	169,198	D. 26,181	15.6
West Penn. R. R.	56,995	34,635	I. 22,360	64.0
Southwest Penn. R. R.	7,746	10,203	D. 2.457	24.1
Pittsburgh Region, Penn. R. R.	101,437	52,741	I. 48,696	92.4
Total bituminous	428,645	381,862	I. 46,783	12.2

River shipments from the Pittsburgh Region continue large, continued high water enabling the coal men to send boats down the Ohio without trouble. Some estimate of the amount which can thus be taken is shown by the fact that 15,000 tons on one tow is common, and even 20,000 tons do not make an extraordinary tow for the largest boats. Now 15,000 tons would load at least 1,000 cars, or about 40 trains; that is, 40 locomotives would be required to carry west from Pittsburgh the coal which goes down in one tow. The largest tow on record on the Ohio started from Louisville for New Orleans about two years ago; it had one steamboat and 36 barges, and carried 24,513 tons of coal and 700 tons of coke.

Coke tonnages reported for the two months are as follows:

	1881.	1880.	Inc. or Dec.	P. c.
Bellefonte & Snow Shoe	1,395	73	I. 1,322	.....
Allegheny Region, Pa. R. R.	15,902	9,573	I. 6,329	65.9
Penn and Westmoreland	24,431	18,741	I. 8,690	46.5
West Penn. R. R.	14,318	13,697	I. 621	4.5
Southwest Penn. R. R.	238,878	113,480	I. 125,398	110.5
Pittsburgh Region, Pa. R. R.	62,909	95,125	D. 32,216	33.9
Total coke	360,833	250,689	I. 110,144	43.9

The new bituminous coal district of Bates County, Mo., makes a respectable showing. Shipments for the four months of October, November, December and January were, by Kansas City, Ft. Scott & Gulf from Carbon Centre, 1,341 car-loads, about 20,000 tons; from Rich Hill, 4,059 cars, about 60,000 tons; by Missouri Pacific from Rich Hill, 34,233 tons; total, 114,268 tons. Business did not fairly begin till October.

Shipments from the coal mines at Sewanee, Tenn., over the Nashville, Chattanooga & St. Louis road in February were: Coal, 381,095 bushels; coke, 291,522; total, 572,672; total, February, 1880, 479,974; increase, 192,643 bushels, or 40.1 per cent.

Provision Exports.

The Bureau of Statistics reports an immense increase in the values of provision exports in January—no less than 59 per cent. This, however, was largely due to high prices, though in hog products there was an enormous increase in quantities. For the three months ending with January there was an increase of more than 50 per cent. in values, and in that time about two-thirds of the whole (in value) was exported from New York and six sevenths from New York and Boston; Philadelphia exporting 6 per cent. and Baltimore 5¾ per cent., and other places only insignificant quantities. For the nine months ending with January the exports of dairy products alone were nearly 50 per cent. greater than in the corresponding nine months of the previous year, and of these 86.5 per cent. was shipped from New York, 10.5 from Boston, and only 3 per cent. from all other places.

THE SCRAP HEAP.

Locomotive Building.

The Louisville & Nashville Co. has decided to have built at once a number of consolidation freight engines with 20 by 24 in. cylinders. Probably 40 will be built or ordered in all.

The New York, New Haven & Hartford shops, in Hartford, Conn., have just completed a six-wheel switching engine, without truck. The cylinders are 16 by 22 in., drivers 4 ft. diameter, and the engine weighs 30 tons.

The Nashville, Chattanooga & St. Louis has decided to order eight new ten-wheel freight engines.

The Mason Machine Works, in Taunton, Mass., are building five passenger locomotives for the Fitchburg road.

Car Notes.

The Wason Manufacturing Co., at Brightwood (Springfield), Mass., now employs 700 men, and is turning out five passenger and 36 freight cars a week. Among the work ahead are orders for cars for the Southeastern, of Canada; European & North American; Maine Central; Portland & Rochester; Connecticut & Passumpsic Rivers; Connecticut River; Housatonic; New Haven & Northampton; Rochester & Pittsburgh; New York & Sea Beach; Central, of New Jersey; Wheeling & Lake Erie; Gulf, Colorado & Santa Fe; Galveston, Houston & Henderson; Panama, and the Mexican Central. Nearly all the passenger cars now are painted in dark colors.

The machine shop, foundry and erecting shop of the Laconia Car Co., at Laconia, N. H. were destroyed by fire last week, causing a loss of about $30,000, which is partly covered by insurance.

The Nashville, Chattanoga & St. Louis shops in Nashville, Tenn., are to build 100 new ore cars for the road.

The Barney & Smith Manufacturing Co., at Dayton, O., are to build 600 box, 400 stock and 500 flat cars for the Northern Pacific; also a number of caboose cars and several sleeping coaches.

Mr. Albert H. King and associates have bought from D. B. Grant the Douglas Forge on West Sixteenth street, New York, with all the plant for making hammered car axles. The forge is now running single turn and making 32 axles a day, but the new owners intend at once to put up more hammers, and to increase the capacity to 125 axles a day. They have some large orders and expect to turn out good work. The new concern is known as the New York Steam Forge Co.

Bridge Notes.

The Toronto Bridge Co., in Toronto, Ont., has been awarded the contract for a highway bridge over the Thames River at London, Ont. The contract price is $6,000.

The Morse Bridge Co., in Youngstown, O., is running its shops night and day to fill orders.

The Edge Moor Iron Works, near Wilmington, Del., have already delivered about 500 tons of the steel work for the East River (New York & Brooklyn) Bridge. About 500 tons more will be delivered by April 1, and 1,000 tons a month thereafter until the contract is filled.

Iron and Manufacturing Notes.

The Clayton Steam Pump & Air Compressor Works in Brooklyn, N. Y., have recently shipped duplex air compressors to Canada and Australia, those to the latter country being the first ever sent there from America; a compressor with 18 by 24 in. cylinder to the Morris Run (Pa.) Mining Co., to be used in running a Harrison cutting machine; another large one to the Chateaugay Ore Co., at Plattsburg, N. Y.; another for use in sinking the caissons of the Northern Pacific bridge over the Missouri at Bismarck, Dak.; and then smaller compressors.

The Indianapolis Rolling Mill has been shipping rerolled iron rails to Ft. Scott, Kan.

The *Bulletin* of the American Iron & Steel Association

The Philadelphia Iron & Steel Co. started up a plate mill last week.

The new blast furnace of the Crane Iron Co., in Catasaqua, Pa., is nearly finished. The stack is 75 ft. high, and it is said to be the highest furnace in the Lehigh region.

It is proposed to start Bessemer steel works in Youngstown, O., and a committee has been appointed to procure land and get estimates of cost.

Chouteau, Harrison & Valle, in St. Louis, lately took orders for 5,000 kegs of track-bolts and are very busy in all departments.

The Danville (Pa.) Iron Works have contracted to furnish the iron rails for the Meadville Railroad.

The Portsmouth Iron & Steel Co., in Portsmouth, O., have more orders on hand than they can fill for the present.

The Rail Market.

Steel rails are quiet with quotations unchanged at about $60 per ton at mill, though more is asked for immediate delivery. The mills are all very busy, and it is impossible to place large orders for early delivery.

Iron rails are quiet, with no large transactions reported. Prices are $46 to $47.50 per ton at mill for heavy sections, and $50 to $52 for light rails.

Old iron rails are unsettled. Sales are reported at $27 to $28 per ton in Philadelphia, and $27.50 to $29 in New York.

International Railway Exhibition.

The committee for an international railway exhibition at Berlin has held two meetings. The co-operation of Austria is regarded as sure. The Lehrter Railway Station is contemplated as the fittest place; after opening of the city railway this will be free, and it is proposed to use it as a permanent exhibition building. With addition of the arches of the city railway, the space at disposal will be over 500,000 square metres, and so nearly three times that of the Düsseldorf Exhibition.—*English Mechanic.*

Specifications for Steel Boiler Plate.

The Pennsylvania Railroad Company has recently issued new specifications for steel boiler and fire-box plate, which we give below, and which annul all former specifications. They are as follows:

SPECIFICATIONS FOR BOILER AND FIRE-BOX STEEL.

All specifications for boiler and fire-box steel are hereby annulled and superseded by the following:

1. A careful examination will be made of every sheet, and none will be received that show mechanical defects.

2. A test strip from each sheet, taken lengthwise of the sheet and without annealing, should have a tensile strength of 55,000 lbs. per square inch and an elongation of 30 per cent. in a section originally 2 in. long.

3. Sheets will not be accepted if the test shows a tensile strength of less than 50,000 lbs. or greater than 65,000 lbs. per square inch, nor if the elongation falls below 25 per cent.

4. Should any sheets develop defects in working they will be rejected.

5. Manufacturers must send one test strip for each sheet (this strip must accompany the sheet in every case); both sheet and strip being properly stamped with the marks designated by this company, and also lettered with white lead to facilitate marking.

How He Got the Contract.

A story is going the rounds of the railway offices which illustrates the wasteful patronage bestowed on snide publications by the railroad companies. A solicitor of advertisements for a cheap paper called upon the general passenger agent of a road for an advertisement. He was willing to take tickets in payment. The agent told him he would not give him an advertisement, but he would aid him in getting a big advertisement from a rival line. "I will draw up a contract," said the agent, "agreeing to pay you $880, in tickets, for the insertion of my advertisement in your paper for one year; but it is understood that the contract is bogus, and that my company shall not be held for the payment of a dollar. Here are half a dozen tickets, which, it is understood, you will return to me after you have used them as I may direct. Now, sir, take this bogus contract, and these tickets, and go over and see Mr. —— of the —— line. Quietly show him the contract, and shake these tickets at him, and tell him all the other roads are going to advertise." The solicitor followed the directions to the letter. He secured for his paper an advertisement for which the railroad company is now paying at the rate of $1,760 per year. The payment is made in tickets, but he can find ready sale for them among the scalpers. The railway companies in this city fritter away annually an enormous sum of money for advertisements in publications which have little or no circulation.—*Detroit Post and Tribune.*

An Expensive Passenger.

The Iowa City (Ia.) *Republican* says: "A gentleman living in Minneapolis, Minn., purchased a palace car ticket some days ago for St. Louis, and started on his journey. A storm arose, and the railroad men took council one with another, and decided that the road was impassable between Cedar Rapids and St. Louis, so that their passenger could not continue his journey by that route, but as he was the holder of a high-toned ticket, and the company was responsible for the regularity of his meals, etc., he was installed in one of Cedar Rapid's best hotels, and in a day or so a palace car, for his special benefit, was put upon the plug road, and he was forwarded to Iowa City. Here he was installed at one of our hotels, and after a short rest was furnished with a ticket over the Rock Island road to his destination, and sent on his way rejoicing. This gentleman probably got more for his money than any other traveler ever did, as all bills for hack, hotels and special cars were footed by the railroads."

Large Bessemer Production.

"The *Bulletin* of the American Iron and Steel Association," of Feb. 23, says:

"When we published the particulars of the large yield of Bessemer steel by the Cambria Iron Company's steel works we thought the Edgar Thomson Steel Company would soon be heard from, and were therefore not surprised to receive the following letter from our friend, Captain William R. Jones: 'Your statement showing the work done by the Cambria Iron Company's Bessemer department is correct as far as claiming it to be the best 24 hours', the best week's, and the best month's work. But the last item does not place them in the front rank. For the last twelve months the Edgar Thomson Steel Company's works produced 130,694$\frac{2110}{2240}$ tons of ingots, 106,722$\frac{2030}{2240}$ tons of rails, and 3,421$\frac{2011}{2240}$ tons of merchant steel; total finished product, 110,144$\frac{1921}{2240}$ tons. This was done in the same time in which the Cambria Iron Company's works produced 126,194$\frac{740}{2240}$ tons of ingots.'"

A Novel Obstruction.

A correspondent sends us the following: "On Jan. 13 the East-bound express train of the Lake Shore & Michigan Southern, leaving Toledo at about 10 o'clock a. m., was detained one hour 40 minutes at a point some eight miles from Toledo in consequence of a blockade of the line by a frame building that had stalled on a crossing while undergoing the operation of moving.

"All the horses in the neighborhood were hitched to the obstruction, but failed to start it until reinforced by some fifty impatient passengers who combined in a series of energetic boosts that finally effected a clearance of the tracks, and released the express, as well as several freight trains that, when the blockade was raised, filled the track for a long distance on each side of the crossing."

Wear of Steel Rails in England.

In a recent speech to the shareholders Mr. Richard Moon, Chairman of the London & Northwestern Railway Company, said of the maintenance of way expenses: "Looking back a few years I find that in 1874 the cost of relaying the line was £454,000 for materials alone, while in the year 1880 the cost had only been £176,000. A considerable portion of the difference is due to the change in the cost of rails. * * * * When again you compare the number of miles relaid, I find that about 1875 we relaid from 215 to 220 miles each year, whereas this last year we have only needed to relay 150 miles. The question, therefore, arises, how long will this continue? I think I have told you before that this year and last year were somewhere about the average for the future. But we do not feel very clear on that point. We want further experience. But, remember, I once told you we had taken up 84-lb. rails that had been down sixteen years, weighing 59 lbs. We never had iron rails which would wear lower than 74 lbs., so that you see, though your rails last longer, they wear away more, and, therefore, we have considered it prudent not to bring into division in the revenue the profit which we made on the old rails a year ago."

Tramps.

A dispatch from Port Jervis, N. Y., March 9, says: "Jehiel Aumoch, a brakeman, 22 years old, in Conductor Cornelius Whittaker's gang, on the Eastern Division, was assaulted by tramps on the train at an early hour this forenoon, being clubbed and shot, and so badly injured that it is doubtful if he recovers. Aumoch was riding on the cars going through Goshen, when he saw three men get upon a car. When the train arrived near Sterling Junction he went to the car in which the men were, probably for the purpose of putting them off the train. He found them in an oil-rack car. When he got near enough to them, one of them wrenched the brakestick from his hand and struck him over the left eye with it. Aumoch then shouted for oilman Fletcher, when the same man who struck him pulled a pistol and shot him. After the shooting he and the same man clinched, and a scuffle ensued, in which Aumoch was thrown partially from the car, to which he clung for a few moments and then jumped or fell. When the train stopped at Suffern, Aumoch was missed. The train was at once switched, and then the engine was started back in search of him. Near Sterling Junction he was found lying alongside the track, groaning and in a semi-conscious condition. He was taken to Suffern and then brought to Port Jervis. His switch-key is missing, and it is thought likely that the assault may have been committed for the purpose of robbing him of this key."

OLD AND NEW ROADS.

Alliance, Niles & Ashtabula.—This company has filed articles of incorporation in Ohio for a railroad from Alliance to Niles, about 30 miles.

Atchison, Topeka & Santa Fe.—The connection with the Southern Pacific, at Deming, N. M., was reached by the tracklayers March 9, and the last rail was laid with some ceremony. Through trains begin to run this week, and schedule of trains through to California will be arranged shortly. We have not yet received information as to the exact length of the new track.

Atlantic & Pacific.—The track is now laid to Crane's Ranch, N. M., 187 miles from Albuquerque, and 125 from Isleta. This completes the First Division and regular trains are to be put on at once.

Baltimore & Cincinnati.—To comply with the law and begin work within the required time, this company has begun grading a section near Winchester, Va. The road is not to be finished right away, however, unless the force is increased, as only eight men are employed at present.

Bristol & North Carolina.—This company has voted to increase its stock to $500,000. The new stock is taken by the Tinsalia Coal & Iron Company, which agrees to finish the road from Bristol to Elizabethton by July of next year.

Burlington & Missouri River in Nebraska.—The Beatrice Branch is now completed and opened for business to Blue Springs Junction, Neb., 12 miles southward from the old terminus at Beatrice.

Canton & Canal Dover.—This company has been organized in Ohio to build a road about 24 miles long from Canal Dover, the terminus of the Cleveland & Marietta road, to Canton, the southern terminus of the Valley road. This will complete a north and south line from Cleveland to Marietta.

Central Vermont and Northern War.—It is understood that the differences between the Central Vermont on the one hand and the Northern (New Hamoshire) and the other lower roads have reached a final satisfactory adjustment. The Central Vermont freight now once more reaches Boston over the Northern, the Concord and the Lowell roads.

Chicago, Burlington & Quincy—This company has recently completed at East St. Louis, Ill., on the St. Louis Division a large grain elevator, a freight house 40 by 750 ft., a coaling station and a large water station. A brick round-house is to be built soon, and the yard has been much extended. At Beardstown a new brick passenger and office building and a new blacksmith shop have been built, and the

yard extended. Nearly 26 miles of new rails have been laid on this division and 32 miles of fence built.

Chicago, Milwaukee & St. Paul.—A Milwaukee dispatch says: "John W. Cary, general solicitor of the Chicago, Milwaukee & St. Paul Railroad Company, has returned from Yankton, Dak., where he has been to perfect the arrangements for the purchase of the Sioux City & Dakota Railway, a bit of road 131 miles in length. He also attended to the purchase of the Dubuque Southwestern Railway, 57 miles long. The stockholders of the Sioux City & Dakota road met at Yankton Feb. 21, and voted unanimously to transfer their road to the St. Paul Company. The road runs from Sioux City to Yankton, with a branch from Elk Point to Sioux Falls, 131 miles of road. On the 22d a deed of conveyance was made by the Sioux City & Dakota Company in pursuance of said vote, conveying all of their property to the Chicago, Milwaukee & St. Paul Company. The purchasing company expects to extend the road into Dakota and make it a portion of the system of lines with which they are ramifying the territory. At the annual meeting of the Dubuque Southwestern Railway Company, held at Dubuque, the stockholders voted to transfer their road to the Chicago, Milwaukee & St. Paul Company. It extends from Farley to Cedar Rapids, a distance of 57 miles. This company also made a deed of conveyance to the St. Paul road of their property, Feb. 22, and it is now a part and parcel of that road. It is proposed to extend their line at once to Council Bluffs, a distance of 270 miles. This will give the St. Paul almost an air line from both Chicago and Milwaukee to Council Bluffs, and will be of incalculable benefit to both cities."

This company has worked both these roads for some time, and the present action is merely the formal completion of previous negotiations.

Chicago & Northwestern.—The surveys have been completed for the branch which is to run from Carroll, Ia., southwest to Kirkman, in Shelby County, 35 miles. Work is to be begun on this branch as early in the spring as the weather will permit.

Chicago & West Michigan.—The Detroit *Post and Tribune* says: "This company intends to abandon their line from Holland to Fruitport via Nunica, and also the line from Ferrysburg to Muskegon, and run a new line from Fruitport along the north side of Spring Lake to Ferrysburg. The Chief Engineer, John McCalman, was at Fruitport on Saturday last looking over the ground for the new line. This will do away entirely with the Nunica junction."

Cincinnati & Southern Ohio River.—Surveys have been completed from Cincinnati to Madison, Ind., 80 miles, following the Ohio River pretty closely.

Chicago, St. Louis & New Orleans.—The annual meeting of this company was held at the office of the company in New Orleans, March 2, 75,492 shares being represented. The shareholders approved the actions of the directors during the year past, and ordered all the revenues derived from working the road, beyond the absolute necessary expenses, and the interest on the first mortgage and earlier bonds, to be applied to the improvement of the property during the present year, and the nece sary arrangements to be made to change the grade at some convenient period during the coming summer. The Vice-President, Mr. James C. Clarke, stated to the meeting that pursuant to the instructions of the shareholders at their last annual meeting the improvements had been made with as much rapidity as was consistent with due economy; that, owing to the scarcity of labor, and, at times, to the rainy weather, it had been out of his power to prosecute these improvements with the rapidity desired at the last meeting, but that during the year 11,929 tons of steel rails had been laid in the track, and 200 freight cars had been built; that the rolling stock now stands, 101 locomotives, 1,843 freight cars and 70 passenger, baggage and mail cars; that about 85 miles of track had been ballasted and about 30 miles of fencing had been erected; that a very important reduction of grades had been effected, reducing many of the grades upon the road to 35 feet; that this had enabled them to widen the embankments, and that upwards of 100,000 cubic yards of material had been distributed in this way; that the ties placed on the track during the last three years amounted to about 666,000, or 1,200 ties to the mile; that about two and one-half miles of the trestle bridges between East Cairo and Jackson, Tenn., had been filled to a very large extent and that the road was in every respect in a safer and better condition than at any previous date; that the directors had recently purchased 12,000 tons of steel rails, making 44,000 tons, of which about 4,500 tons had been distributed and put in track since Jan. 1; that several cargoes were in transit from New York, and that he hoped to have this 12,000 tons in the track by June 15, requiring only 5,000 tons to replace the entire track with steel rails; that these 5,000 tons had been purchased of the Bethlehem Company, at $57.50 per ton, for delivery in May, June, July and August; if the season is favorable, the management expected to have the track finished with steel the coming autumn; that purchases had been made of machinery and tools necessary to alter the engines and cars to the gauge of the roads north of the Ohio River; that the expense beyond that already incurred to make this change of gauge would probably be $200,000.

Dayton & Southeastern.—The Toledo, Delphos & Burlington Company having bought the controlling interest in this company, an agreement for the consolidation of the two companies has been concluded and approved by the directors. A new mortgage will be put upon the road for the purpose of paying off the existing debts and extending the road to the Ohio River.

Delaware Western.—The new transfer of the Philadelphia, Wilmington & Baltimore will, it is thought, secure the proposed expansion of this road into a line between Baltimore and Philadelphia. Nothing is decided as yet, however, and the extension probably depends upon the assistance which Mr. McComb may be able to secure from the Baltimore & Ohio or other parties interested.

Denver, Longmont & Northwestern.—This company has recently placed in Boston $100,000 bonds secured on its road, the first section of which is now under construction from Denver, Col., to Longmont, 32 miles. The total issue authorized is $90,000. The bonds were sold at 90, a bonus of five shares of stock being given with each $1,000 bond.

Denver Union Depot—A corporation called the "Denver Union Depot & Railroad Company," four-fifths of whose stock is said to be owned by the Union Pacific Company, is building in Denver a union passenger depot for the accommodation of the several roads entering that city. It is built from designs and under the superintendence of Mr. W. E. Taylor, and the estimated cost is reported as nearly $500,000. The following description of the structure is given by a correspondent of the *Chicago Tribune*:

The main building is in what is called the domestic Gothic style, and is 503 ft. in length from northeast to southwest, and is 65 ft. in breadth. It is built with two stories throughout the central portion—the two extremities being a few feet higher than the rest, producing a pleasing effect. The building is all of cut stone—the main body of the walls being built of the beautiful light-red sandstone from the immense quarries at Morrison, on the South Park Railroad, pointed and well finished. The ashlar work is the fine gray lava from Castle Rock, on the Denver & Rio Grande Railroad; and the elegantly-carved trimmings of doors and windows, and the graceful arches over the main entrances, are of clear white magnesian limestone from the quarries near Manitou Springs. The highly-polished Scotch granite columns supporting the curved arches of the main entrances were imported from Scotland; and to my surprise, in reply to my question as to why some of the splendid granites of our own mountains were not used for this purpose, I was told that it cost less to import them by sea, and bring them by rail nearly 2,000 miles, than to finish them in this manner at home.

"The first floor is devoted entirely to depot purposes; and the ladies' and gentlemen's reception rooms and the baggage rooms, are the largest, I think, in the country. The ceilings are 20 ft. in height, and are to be elegantly paneled and frescoed. In the ladies' and gentlemen's reception rooms, though heated with steam, there will be handsome marble mantles and fire-places, with immense mirrors over them. Convenience has been studied in every regard. The great ticket-office and that of the Pullman Palace-Car Company lie between the two apartments, and there are separate passages to the baggage rooms, so that ladies unattended will have no trouble in serving themselves. The great main entrance and hall are located midway of the building, and will be finely finished with stone carvings, varicolored tile floors, etc. Over this entrance is a clock-tower, 165 ft. in height, in which an iron staircase will ascend to the top, affording an unequaled view of the city, the mountains, and the surrounding country. The north end of the first floor will be occupied by an immense dining-room, furnished and finished with unusually elaborate elegance. Then farther north are the telegraph, express and other offices. The upper floor is devoted exclusively to the general offices of the railroad companies using the depot.

"On the west side of the building, and connected with it, will be the great covered sheds of the passenger trains, supported on iron columns with ornamental brackets and trussed roofs, and covering six tracks side by side. The size of this yard may be judged from the fact that there will be three miles of track in it. On the eastern side of the depot facing the city will be an unusual and most pleasing adjunct to a railroad depot, in the shape of an elegant park, 800 ft. long and 166 ft. wide, surrounded by an ornamental iron fence, the whole to be planted with the choicest shade-trees, and laid out in walks and drives, with grass-plats, fountains and flower-gardens, under constant and competent care. A drive 8 ft. wide will lead up to the main entrance of the building, on one side of which will be the hack-stand, and on the other that of the omnibusses, so that passengers can chose their conveyances without running the gauntlet usual at most city depots. Baker, Smith & Co., of Chicago, have the contract for steam-heating the building; and both building and grounds will be brilliantly lighted at night by the Brush patent electric apparatus.

Detroit, Lansing & Northern.—The Fish Creek Branch is now completed from a point on the main line near Colby, Mich., to Fish Creek, a distance of five miles. There are three large saw-mills on the new branch.

East Tennessee, Virginia & Georgia.—At a meeting of the board in Knoxville, Tenn., last week, it was resolved to execute a consolidated mortgage to secure $10,000,000 new 5 per cent. bonds. A part of these bonds are to be used to pay for the Selma, Rome & Dalton road lately bought, and a sufficient amount is to be reserved to retire all the existing debt of the company as it matures.

Georgetown, Breckenridge & Leadville.—This company was recently organized to build what is locally known as the High Line road, from Georgetown, Col., the terminus of a branch of the Colorado Central, by way of Montezuma, Ten Mile and Breckenridge to Leadville, a distance of about 70 miles. Work has been begun on the road.

Grand Trunk and Great Western Amalgamation.—The movement for the union of these two companies having been renewed in London, the following article from the Toronto *Daily Globe*, of March 3, the leading organ of one of the Canadian political parties has decided interest:

"The agitation of a fusion of interests of the Grand Trunk and Great Western railways has once more been renewed by Grand Trunk wire-pullers in London. Mr. Abbott, an eminent broker, is the champion of the movement, and papers presumably in the Grand Trunk interest openly or covertly advocate amalgamation. Colonel Grey, the Chairman of the Great Western Railway, has found it necessary to address a letter to his shareholders, with the object of inciting sustained hostility to Mr. Abbott's proposition, which was defeated at the last meeting of shareholders. This last named gentleman finds his principal argument in the reduction of expenses, which he puts at one million of dollars per annum. Colonel Grey puts the saving to be effected at one-tenth of this sum, and takes pains to say that in opposing the fusion he is acting only in behalf of *bona fide* investors, leaving it to be understood that Mr. Abbott's clients are of a different stamp. He deprecates expensive rivalry, admits past follies, and declares that all along his board has been 'willing to enter into the closest alliance permissable under the Acts of the Dominion of Canada governing the two bodies.' The *Railway News* of Feb. 12, commenting on this letter, says: 'If no present power exist for fusion of the undertakings, there is no reason why the Canadian Parliament should not give the necessary powers for such an arrangement.' And it goes on to say: 'It is generally known that the Premier of the Dominion has stated that there would be no objection on the part of the government to such a proposal.'

"Now it is obviously unnecessary on this side of the Atlantic to say one word against this constantly arising question of amalgamation; for whatever the boards may do in England, we here have the final say in the matter. The step would be regarded in Ontario as one entirely destructive of the safeguards and checks instituted by our past railway policy, and as being likely to intensify all that has for years past been said of the injustice worked to local rates and freights since the passion for through traffic first seized upon the Anglo-Canadian railway managers.

"It would be almost as easy to bring about a fusion of the Legislatures of Ontario and Newfoundland as to persuade the Railway Committee of the House of Commons at Ottawa to entertain an application for any such amalgamation. And if Sir John Macdonald so far forgot himself, when in London, as to make use of the expressions attributed to him, he certainly had not any other intention than to complacently gull his hearers. Nobody can know better the impossibility of such a course. But if it be true that 'there is no objection on the part of the government,' by all means let this be one more plank in the Ministerial platform at the next general election. In the meantime we are inclined to think that if any member were to ask the Premier if he had so committed himself when in England, an answer would be given not very satisfactory to those who inspired the *Railway News*. Without further considering the unfairness to shippers throughout that part of the Western Peninsula traversed by both roads, it is only needful to point out the great danger to the state that would arise from the creation of so gigantic a corporation. The aggregate earnings of the Grand Trunk are about $10,000,000 per annum. Those of the Great Western are, say, $6,000,000. Answerable to nobody in this country, the General Manager of the amalgamated company would wield a patronage greater than that of the Prime Minister of Ontario, responsible to the House and country. His power would be enormous, and it could only be expected that he would exercise it for the benefit of his company, when the interests of the public and of his company were at variance. Nor could any one man properly manage such a road, when in our opinion the size of the Grand Trunk already overtaxes any one man's power of remedying abuses and hearing both sides of the many questions at issue between shippers and local agents. The Great Western road has proved itself able to exist and prosper independent of the Grand Trunk, and whatever may be the swallowing capacity of that road it will not be allowed to gorge itself with its most formidable rival. People in England interested in the stocks of the two roads have, we know, addressed inquiries to gentlemen in this country with the view of ascertaining the real state of public feeling on the subject. If Sir John is really of the opinion with which he is credited, he will before long have an opportunity of testing the constituencies, and their answer will be no less emphatic than that which he is reported to have given to the Grand Trunk emissaries. But it will not be to the same effect."

There certainly need be no dangers to Canada from the union of the two companies, for whatever there might be could be provided against in the act authorizing it; but it will doubtless be almost impossible to convince the Canadians of this; and especially those in the western part of Ontario, who are unduly favored by the present condition of things.

Knoxville & Ohio.—Surveys are now in progress for the extension of this road from Careyville, Tenn., to the Kentucky line. Eight miles of the road beyond Careyville were graded several years ago.

Minnesota State Railroad Bonds.—Gov. Pillsbury, of Minnesota, has issued the following notice:

"A bill has passed the Legislature and received the executive approval, providing for the adjustment of the Minnesota state railroad bonds on the terms proposed by the majority of the bondholders to the Legislature of the state. The bill provides that the state will pay 50 cents on the dollar of the principal and interest of the Minnesota state railroad bonds, and coupons computed to Jan. 1, 1884, in new adjustment bonds payable in 30 years, redeemable at the election of the state after 10 years, with interest at 5 per cent., the first coupons maturing July 1, 1884, payable in the city of New York, with election to the state to negotiate the new bonds and pay cash instead. All unpaid claims for supplies, etc., not to exceed $15,000, are to be paid 50 cents on claims proven, and the amount so paid deducted from the amount of the new bonds issued to the road which ought to have paid such claims; all provided that the tribunal created by the bill, which is to convene on the 23d of March, 1881, shall decide that the constitutional amendment of 1860, prohibiting the provision for payment without submission to the people, is void, otherwise the bill to be submitted to the people at the next general election. All holders of Minnesota state railroad bonds are to file their bonds on or before March 23, 1881, with the State Auditor, accompanied by an agreement to accept said new bonds in full satisfaction of the old ones, describing them by number, etc., and a release under the seal, releasing the state from all claim by virtue of the old bonds. The bill provides for payment of interest from the tax on gross earnings of railroads."

Nashville, Chattanooga & St. Louis.—At a meeting held in Nashville last week the board authorized the building of 300 box cars, by contract; 100 ore cars, to be constructed at the Nashville shops, and eight new ten-wheel, 45-ton freight engines, costing in all about $200,000. They also decided to place the Northwestern Division in first-class condition before the close of the present year. Steel rails will be laid between Nashville and Waverly. Of this amount 20 miles have already been laid, as well as 37 miles of iron. The rails west of Johnsonville have been in use ever since the war. The expense of renewing the track will be about $200,000. To cover the improvements contemplated on the Chattanooga and Northwestern divisions, the board authorized the negotiation of $1,000,000 second mortgage bonds.

New York, Albany & Buffalo.—The bill to charter this company with authority to build a railroad along the berme bank of the Erie Canal has been reported adversely by the Canal Committee of the New York Legislature. The report was laid on the table, to be taken up hereafter.

New York & Atlantic.—The route of this road as finally located is from Gowanus Bay, at Thirty-sixth street, Brooklyn, N. Y., to Greenwood Cemetery; thence over the Brooklyn, Bath & Coney Island track to Bath road; thence through New Utrecht, Gravesend and Flatbush to the Cemetery of the Holy Cross in Flatbush; thence through New Lots to East New York, whence the track of the Canarsie road will be used to Canarsie, from which place a ferry runs to Rockaway. The road will be elevated from Gowanus Bay landing to Greenwood Cemetery. It will cross all the lines to Coney Island above or below grade. A contract has been let for the construction of the road. It will reach Greenwood and Holy Cross cemeteries, to which there is a great deal of travel.

New York & Chicago.—This company has filed articles of incorporation in Indiana to build a railroad across that state, passing through Ft. Wayne. It is the Indiana section of the projected new line from Cleveland to St. Louis and Chicago.

New York City & Northern.—The bridge over the Harlem River is completed, connecting the track of this road with the Metropolitan Elevated near High Bridge. Arrangements are being made to put on regular passenger trains in connection with the Elevated road.

It is understood that a controlling interest in the road has been sold to Mr. W. R. Garrison and others largely interested in the Manhattan Elevated, so that it will be under substantially the same management.

New York & New England.—Work is to be begun next week on a second track from Walpole, Mass., to Hartford, Conn., 98 miles. The work will be continued through the summer.

Niagara River Bridge Co.—A bill has been introduced in the New York Legislature to incorporate this company, with power to build a bridge over the Niagara River at a point to be located by a board of commissioners named in the bill. The capital stock is fixed at $1,000,000. The bill gives the company power to build approaches and connect-

ing tracks to extend not over two miles from the east or New York bank of the river.

Oregon Railway & Navigation Co.—Notice is given that the third, fourth and fifth assessments of 20 per cent. each, upon the subscriptions for the first three millions of the new capital stock of the company (authorized by the special stock-holders' meeting of Oct 20, 1880), are required to be paid at the company's offices in New York on April 1, May 2 and June 1 next, respectively provided however, that payment in full for said subscriptions will be received by the company at its said offices on and after March 10, 1881, and the new stock issued therefor and settlements made, including the payment of scrip dividend of 10 per cent.

Interest on payments made before or after Feb. 1, 1881, will be computed to that day, from which time full paid stock will be entitled to dividends.

The second three millions of new stock (30,000 shares) will be offered for subscriptions at par to stockholders of record on March 21, 1881, in proportion to their respective holdings on that day. Twenty per cent. of said subscriptions will be required to be paid at the company's office in New York on April 15, 1881; 20 per cent. on June 15, and the balance of 40 per cent. on July 1.

Provided, however, that payment in full for said subscription to said second three millions of new stock will be received by the company on and after April 15, 1881, the new stock issued therefor, and interest on payments adjusted to May 1, 1881, from which date it will be entitled to dividends.

A scrip dividend of 10 per cent. will be paid to the holders of the second three millions of the new stock at the date of payment of the last installment of their subscriptions thereto, said scrip to bear 8 per cent. interest from Nov. 1, 1881, and to be payable out of the surplus net earnings of the company properly applicable thereto; the certificates therefor to be in the same form as those issued by the company Nov. 1, 1880.

The transfer-books of the company will be closed on March 21, and reopened on April 16.

As to the extensive improvements and projected new lines of the company, the Walla Walla (Wash. Ter.) *Union* says: "We understand that Mr. Villard has recently purchased 20,500 tons of heavy steel rail, enough for 225 miles of road, that part of these rails are now on the way to Portland, and the rest will be on the way inside of three months. In addition to this, the Oregon Railway & Navigation Company has between Walla Walla and Portland rails enough for 160 miles of road. It is further reported that the company has obtained all the money, some $12,000,000, necessary to pay for the speedy construction of its proposed system of roads in this country. If there is no bad luck, in one year from to-day the Oregon Railway & Navigation Company will have in running order a broad-gauge railroad from Walla Walla to Portland, 244 miles; from Walla Walla to Colfax, via Grange City, 112 miles, with a branch to Dayton, 14 miles, while the road over the Blue Mountains to Baker City will be well under way, and possibly a great part of it in operation. Between Walla Walla and the Dalles, 158 miles, there is about 30 miles of track to be laid, on a bed already prepared, to make through rail connection with that point. When the connection is made, the gauge of the track between Umatilla and this city will be changed to the standard, 4 ft. 8½ in. gauge. From the Dalles to Portland there is only 86 miles of railroad to be built, and it is so located that a large force of men can be employed in constructing each mile of it, if necessary. From Walla Walla to Grange City the grade is nearly completed, while the work of grading the branch to Dayton has been finished. The road to Colfax will start from some suitable point opposite Grange City, about four miles below Texas Ferry. The road over the Blue Mountains will start from Umatilla and cross the mountains at an elevation of over 4,200 ft. Some five miles of the road over the Blue Mountains will have a grade of 110 ft. to the mile. The distance to Baker City from Umatilla is 170 miles. It is confidently predicted that the road will be completed by July, 1882, and that Baker City will be reached by a road two years from to-day."

Painesville, Youngstown & Pittsburgh.—This company has been organized to build an extension of the Painesville & Youngstown road from Youngstown, O., by North Lima and Springfield to the Ohio River.

Pennsylvania.—At the annual meeting in Philadelphia, March 8, Mr. William Lockwood, a stockholder, made some sharp criticism on the management of the company. He met with no support, however, and was voted down unanimously.

The meeting passed unanimously resolutions relating to the services of Col. Thomas A. Scott to the company.

Mr. John Taylor, of the banking house of John Taylor & Co., London, made a short speech, in which he said that his house held one-third of the English holdings of the Pennsylvania Railroad Company, and it would be seen that his interest in the great corporation was a live one. He had some criticisms to offer upon its management, but they would be in a kindly spirit, he said. He contrasted the system of declaring dividends in vogue in America with that in England, and held that the latter was the best. He thought—and he spoke for the English stockholders, he said—that the money obtained from Allegheny County in payment of the riot losses should have been charged to the revenue account, since the losses had been replaced by the company from the profits of the road. In other words, he thought the stockholders should have received something from the restitution. The burden of his argument was that the English holders wanted bigger dividends, and less expenditures for improvements.

The event of the meeting was the announcement by President Roberts of the purchase by the company of the controlling interest in the Philadelphia, Wilmington & Baltimore (more fully explained elsewhere). This was received with applause, and the stockholders passed at once the following resolutions offered by Mr. Roberts:

"*Resolved*, That the purchase of stock of the Philadelphia, Wilmington & Baltimore Railroad as reported by the President be authorized, ratified and approved.

"*Resolved*, That for the purpose of providing a part of the whole of the means to pay for the capital stock of the Philadelphia, Wilmington & Baltimore Railroad Company so purchased, and for such other purposes as the directors may deem for the best interests of the company, there be issued from time to time 400,000 shares of stock of this company in addition to the number of shares of the increased capital stock which the directors were heretofore empowered to issue, sell, apportion and dispose of."

Philadelphia, Wilmington & Baltimore.—It has been understood for several days that there was a hitch in the negotiations for the sale of a controlling interest in this road to the Gould-Garrett syndicate, and that Mr. Thayer was unable to secure the stock he had expected to deliver. Last week a number of the Boston holders put their stock in the hands of a committee, and at midnight on March 7 this committee negotiated a sale to the Pennsylvania Railroad Company at $78 per share, that is, 156 per cent. of the par alue. The sale was announced at the Pennsylvania meeting ext day, and the necessary funds voted. The following story of the transaction is told by the Philadelphia *North American*:

"When the syndicate, composed of Messrs. Gould, Garrett, Haven, Drexel, and others, whose names have already been published, made an agreement with Mr. Nathaniel Thayer, of Boston, to buy of him a controlling interest in the Philadelphia, Wilmington & Baltimore Railroad, provided he could secure it for them by the 15th of this month, the officials of the Pennsylvania Railroad were offered the opportunity to buy one-third of the interest when Mr. Thayer should have delivered it. It will be remembered that this syndicate in the interest of the Baltimore & Ohio, Jersey Central and Reading combination, was organized about Thursday, Feb. 17, and that Mr. Cassatt, First Vice-President of the Pennsylvania, was in New York conferring with them on Saturday, the 19th. The Pennsylvania, through him, declined to take one-third of the interest in partnership with rival corporations. The Boston stockholders, who own about 86 per cent. of the whole capital stock of the Philadelphia, Wilmington & Baltimore, as soon as the terms of Director Thayer's agreement became known; saw that there was time before the 15th of March for some concerted action on the part of opposing interests to prevent the fulfilment of his bargain, and a large number of those who were willing to sell at once resolved to get all they could for their stock. So they informally agreed upon a committee made up from themselves, with whom the stock for sale could be deposited, and who should be authorized to negotiate for the best terms they could get from either competing party. This committee was composed of Henry P. Kidder, of Kidder, Peabody & Co., who was formerly Mr. Thayer's business partner; Charles U. Cotting, Henry L. Higginson, Charles P. Bowditch and William Minot. For days after it was constituted large blocks of the stock were brought in and placed in charge of Mr. Kidder, the chairman. As much as 15,000 shares came in one day, while Mr. Thayer has had great difficulty from the first in securing such lots of stock as would indicate his success in his agreement. It was believed that Mr. Thayer was not authorized to go beyond a certain figure, while Mr. Kidder's committee offered chances of getting more. It was not till Thursday last, however, that the Pennsylvania began to negotiate with Mr. Kidder. The telegrams that passed between them soon convinced both that mutually satisfactory terms could be arranged, and accordingly the conference of Monday was agreed on. Having secured a large number of shares, Mr. Kidder's committee started for New York on Monday morning last to see how much they could get for their holdings. The officers of the Pennsylvania Railroad went over to New York on Monday and had interviews with the ruling spirits of the Gould-Garrett-Haven syndicate. The Boston committee was mentioned, and the syndicate people advised the Pennsylvania officials to let them alone, as they were just organized for the purpose of getting all the money they could from Thayer, and probably wouldn't sell to anybody else. But President Roberts, Vice-President Cassatt and the rest took this kind and disinterested advice with a very large grain of salt, and on Monday evening had a conference with Mr. Kidder and his committee at the Brevoort House. The result was the consummation of a bargain about midnight, by which the Pennsylvania Railroad purchases between 90,000 and 100,000 shares of the stock of the Philadelphia, Wilmington & Baltimore Railroad Company at $78 a share, and the July 4 per cent. dividend paid at $2 a share. The Philadelphia, Wilmington & Baltimore Company's capital stock consists of 231,455 shares, par value $50; an actual majority of this is 115,728 shares, and there is no doubt that the Pennsylvania will have secured this number of shares by the first of April, as they agree to take all the stock that is offered before the date mentioned at the price stated above. So much is offered every day in Boston at present that it is extremely probable that the majority desired will be obtained before the close of this week. The only danger, if danger it can be called, is that the Pennsylvania will get a great deal more stock than it requires before the first of April; but in spite of this it will adhere to its agreement to take all that is offered.

"The 400,000 shares of Pennsylvania Railroad new stock to be issued to raise money to complete the purchase will be issued at $50 a share (later advices say it will be sold at market price), and with the stock selling at $67 in Third street, as now, there is no doubt it will be very promptly taken. The earnings from the Philadelphia, Wilmington & Baltimore property are exected to be large enough to pay the dividends on the new Pennsylvania stock. The Philadelphia, Wilmington & Baltimore Company will still retain its organization under the wing of its great owner, but the depot is to be that of the elevated railroad at Fifteenth and Filbert, and the Pennsylvania expects that by the reduction in depot and other such expenses they will effect a saving of $150,000 a year.

"The Baltimore & Ohio will be offered the same facilities it enjoyed before the opening of the Bound Brook route to New York, when it sent its through freight and passenger business over the New York Division. If it would continue to use the Philadelphia, Wilmington & Baltimore, it must use the New York Division too. Otherwise no restrictions whatever will be placed on it, and no delays at the West Philadelphia yard, such as gave rise to the Junction Railroad litigation, will be permitted, except such as are absolutely unavoidable through unforeseen accidents, which will sometimes happen in the best regulated railroad families."

It is reported from Philadelphia that very liberal terms are to be offered to the Baltimore & Ohio for the use of this road by its trains. While these negotiations are pending no obstacles will be placed in the way of the Baltimore & Ohio trains to New York.

Pittsburgh Rapid Transit Co.—The Pittsburgh *Telegraph* of March 5 says: "A charter was granted at Harrisburg yesterday to the Pittsburgh Rapid Transit Company, granting them the right to build an elevated road in Pittsburgh and Allegheny. Colonel James Andrews is President of the company, and the directors are well-known business men of the city. The road will be 12 miles in length; one line extending from a point above the Sharpsburg bridge to the centre of the city; another extending through the South Side as far as Brownstown, and the third line crossing the Allegheny River and extending to Woods Run. The roads will meet in a common centre in the business portion of the city. It has not yet been determined what streets will be occupied by the road, but the intention is to make it as straight a line as possible. The plan of the Sixth Avenue Elevated road in New York will be followed whenever practicable. The projectors of the road say that when it is completed they can move trains between the Post-office and Lawrenceville in seven minutes, and if Councils grant them the right of way they will extend the line as rapidly as the business will justify. Councils will be asked for the right of way at once; and if it is granted work will be commenced within six months. The company has a capital of $700,000."

St. Louis, Iron Mountain & Southern.—A special meeting was held in St. Louis, March 7, at which the stockholders formally voted to authorize the increase of the capital stock to $25,000,000; also to authorize the execution of the consolidated mortgage as proposed, in which to fund all existing debt, and the issue of $2,000,000 new bonds under this mortgage at once for the purpose of laying steel rails and making other improvements. John R. Shepley, as attorney for Henry B. Plant, of New York, a stockholder of the company, protested against an increase of the capital stock, on the ground that it was illegal under the law of Missouri. Mr. Shepley also gave notice that Mr. Plant would resist the action of the company in increasing its capital stock.

The action taken at the annual meeting last week was merely a vote of approval and not a final ratification.

St. Louis & Southeastern.—An order was entered in the United States Circuit Court at Springfield, Ill., Feb. 25, providing that the holders of the overdue bonds and coupons of the St. Louis & Southeastern Railroad must present them for payment to the Register on or before Aug. 1, or be barred out.

Securities on the New York Stock Exchange.—The following securities have been placed on the lists at the New York Stock Exchange:

Alabama Central.—First-mortgage bonds, $1,000,000; income bonds, $1,400,000.

Chicago, Milwaukee & St. Paul.—Iowa & Dakota Division first-mortgage extension bonds, $350,000; Mineral Point Division bonds, $2,160,000.

Flint & Pere Marquette.—Preferred stock, $6,500,000; bonds, $5,000,000.

International & Great Northern.—First-mortgage bonds, $400,000; second-mortgage income bonds, $800,000.

Milwaukee, Lake Shore & Western.—Preferred stock, $5,000,000.

New York City & Northern.—General mortgage bonds, $4,000,000.

Texas & St. Louis.—Stock, $1,520,000; first-mortgage bonds, $480,000; land-grant income bonds, $1,520,000.

Toledo, Delphos & Burlington.—Stock, $4,000,000; main line first-mortgage bonds, $1,250,000; main line income bonds, $1,250,000; Dayton Division first-mortgage bonds, $1,000,000; Dayton Division income bonds, $1,000,000; terminal trust bonds, $250,000.

Shenandoah Valley.—The extension from Waynesboro, Va., to Salem on the Atlantic, Mississippi & Ohio road, is to be put under contract at once. The distance is about 90 miles. The line as located passes through Lexington.

Sinaloa & Durango.—This company has been organized under the general law of Massachusetts to build a railroad from Altala, Mexico, on the Gulf of California, northeast to Culiacan; thence southeast to Durango, and to such other points as may be authorized.

Texas & Pacific.—The track on the extension of the Transcontinental Division is now laid to Pilot Point, Tex., 30 miles south by west of the late terminus at Whitesboro, and 47 miles from Sherman. Only six miles remain to reach Denton, where the line will connect with the Dallas & Wichita, completing the connection between Sherman and Dallas.

Union Pacific.—The following description of this company's new freight depot in Denver is given by a correspondent of the Chicago *Tribune*: "It was built during the past year, and is also of cut stone, 365 ft. long, and nearly 50 ft. wide. It is divided into convenient apartments for in freight and out freight, with inclosed offices for checkclerks, etc. A feature of its construction new to me was in having its entire floor resting upon a separate foundation from that of the walls, so that any amount of weight piled upon the floors would not affect the walls. In the north end are the light and airy offices of this department, completely furnished with every requisite. Outside the building is a platform 1,000 ft. long, resting on stone piers, and solid enough to support a train of elephants. Set in this at different points are eleven large platform-scales. Mr. Keeler, the agent in charge, showed me their manner of transferring freight from the standard gauge to the narrow-gauge cars, which stand much lower. For this purpose a narrow-gauge track is carried alongside the broad gauge, but raised sufficiently high to cover the difference in level and make the transfer easy.

"Still further north is the new round-house, built of cut stone brought from the mountains, and with stalls for 26 locomotives. Just south of the freight depot an immense railroad car-scale is being placed, to which a track will lead which will be entirely under the control of the city, and the purpose of which is to settle all disputes with shippers concerning weights. When the correctness of a weight as stated in the freight-bill is questioned, the car will be run upon the scale, and its verdict shall be final—the expense of weighing to be paid by the party in error."

Virginia Midland.—A branch road about 10 miles long is to be built from a point near Charlottesville, Va., to Stoney Point in Albemarle County. It is to reach an extensive deposit of iron ore, lately bought by Robert Garrett & Sons, of Baltimore.

Wabash, St. Louis & Pacific.—Work has been begun on the extension of the Quincy, Missouri & Pacific Division from Milan, Mo., to Trenton.

Western Union Telegraph.—The following statement is made for the quarter ending March 31, March earnings estimated:

Surplus, Jan. 1	$148,285.14
Net earnings for quarter	1,669,173.87
Total	$1,817,459.01
Interest, construction, etc	302,000.00
Surplus	$1,515,459.01

From this a dividend of 1½ per cent. on the consolidated stock is declared, which will take $1,200,000, leaving $315,459.01 to next quarter's account.

ANNUAL REPORTS.

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Denver & Rio Grande.

This company has published the following official statement for the year ending Dec. 31, covering all its line. In 1879 the mileage worked was 337 miles; during 1880 this was increased to 551 miles, the average for the year being about 460 miles.

The earnings were as follows:

	1880.	1879.	Increase.	P. c.
Passengers	$945,031.00	.....	.....	.....
Freight	2,411,457.25	.....	.....	.....
Mail, expres, etc.	121,578.65	.....	.....	.....
Total	$3,478,066.90	$903,622.28	$2,574,444.62	284 9
Expenses	1,767,605.10	594,746.56	1,172,858.54	197.2
Net earnings	$1,710,461.80	$308,875.72	$1,401,586.08	453.7
Gross earn. per mile	7,561.01	2,681.37	4,879.64	182.0
Net earnings per mile	3,718.40	916.54	2,801.86	305.5
Per cent. of exp.	50.82	65.82	.....	.....

Of the receipts $23,048.17 were for mails, $20,682.05 for troops and $79,944.02 for government freight, making $123,674.24 in all for government business. The sum of $93,459.55 was received for contractors' freight.

The extraordinary increase in earnings was due not only to the extensions built, but also to the very rapid growth of Leadville and other mining camps in the region served by the road. The traffic is now really large, but rates are still very high, and the earnings are much greater than for an equal amount of business on other lines.

Northern Central.

This company owns a line from Baltimore north to Sunbury, Pa., 138 miles; an extension of 4 miles to the Canton freight wharves in Baltimore, and the Green Spring Branch, from Relay House to Green Spring, Md., 9 miles. It leases the Shamokin Valley & Pottsville road, Sunbury, Pa., to Mt. Carmel, 28 miles; the Williamsport & Elmira, 78 miles; the Chemung road, 22 miles; and the Elmira, Jefferson & Canandaigua, 47 miles, the three last-named forming a line from Williamsport, Pa., to Canandaigua, N. Y., 147 miles. Its trains use the Philadelphia & Erie track from Sunbury to Williamsport, 40 miles, and the Philadelphia & Erie use its track from Marysville to Sunbury, 47 miles. The total mileage is 151 owned and 175 leased, 326 miles in all, besides 40 miles used.

The following figures are from statements presented at the annual meeting last week, in advance of the publication of the full report:

The earnings for the year were as follows:

	1880.	1879.	Increase.	P. c.
Passengers	$695,430.28	$627,926.83	$67,503.45	10.8
Freight	4,131,008.16	3,272,301.56	858,706 60	26.3
Express and mail	106,306.76	102,388.40	3,918.36	3.8
Miscellaneous	117,642.09	105,332.03	12,310.06	11.7
Total	$5,050,387.29	$4,107,948.82	$942,438.47	22.9
Expenses	3,255,268.45	2,861,941.97	393,326.48	13.7
Net earnings	$1,795,118.84	$1,246,006.85	$549,111.99	44.1
Gross earn. per mile	15,491.99	12,601.07	2,890.92	22.9
Net earn. per mile	5,506.50	3,822.11	1,684.39	44.1
Per cent. of exps.	64.43	69.67	.....	.....

The gain in earnings was due both to increase in business and improvements in rates received on freight. The increase in expenses was comparatively small, in spite of the general increase in cost of labor and materials.

The income and profit and loss accounts were as follows:

Net earnings as above		$1,795,118.84
Dividends and interest		132,512,06
Pa. R. R. contribution for operating Elmira, Chemung and Canandaigua Division		27,423.37
Royalty on coal mined, Shamokin Div		88,580.22
Total		$2,043,634.49
Interest on bonded debt	$808,060.00	
Interest, discount, ground-rents, etc	62,367.16	
Total rent, Shamokin Div	203,536,21	
" " Elmira & Williamsport	176,177.52	
" " Chemung R. R.	59,944.99	
" " Elmira, Jeff. & Canandaigua	17,704.79	
		1,417,790.67
Surplus for the year		$625,843.82
Add for securities sold		47,792.50
Total		$673,636.32
Charged for depreciation on securities	$46,200.00	
Paid on joint guarantee Balt. & Potomac bonds	196,493.70	
Dividend, 2½ per cent	146,047.50	
		388,741.20
Balance, surplus for the year		$284,895.12
Debit balance of profit and loss, Jan. 1, 1880		97,186.67
Credit balance, Jan. 1, 1881		$187,708.45

The coal tonnage for the year was 2,562,350 tons, against 2,233,008 tons in 1879, an increase of 329,342 tons, or 14.7 per cent. The coal tonnage of the main line was 1,375,792 tons, against 1,185,145 tons in 1879, an increase of 190,647 tons, or 16.1 per cent. There was an increase in the trade going on to the Pennsylvania Railroad at Marysville of 101,601 tons. There was an increase of 1,789 tons to points on the Cumberland Valley Railroad. The total tonnage to Baltimore was 333,667 tons, a decrease of 34,670 tons, or 9.4 per cent.

The total tonnage mileage shows an increase of 14.278 per cent., while the increase in earnings was 26.242 per cent. The average receipts and cost per ton per mile for all lines was in cents:

	1880.	1879.	1878.	1877.
Receipts per ton per mile	0.894	0.810	1.013	1.135
Cost " " " "	0.549	0.540	0.703	0.747
Net receipts	0.345	0.270	0.310	0.388

The terminal facilities at Baltimore were improved during the year by the construction of a pier at Canton 200 ft. long and 120 ft. wide. This pier will be used for transferring iron ore and other bulk freight from vessels to cars. Its entire cost, including that of the necessary tracks, was $40,000.

The report concludes as follows: "From the Treasurer's profit and loss statement it would appear that, in addition to the net income, there was credited in the account during the year the sum of $47,792.50 profit realized from the sale of securities. Your board thought it wise to debit to this account $46,200 depreciation upon certain securities held by the company. It was also charged with $196,493.70, being the amount paid the Pennsylvania Railroad Company in settlement of the amount due it on account of the joint guarantee by your company of the bonds of the Baltimore & Potomac Railroad Company. The improved earnings of the latter company justify the hope that this company's share of the guarantee will not in the future be burdensome. The total net credit to profit and loss Dec. 31, 1880, was $187,708.45, as compared with a debit Jan. 1, 1880, of $97,186.67—this result being reached after meeting all the above-mentioned charges and declaring a dividend upon the capital stock of 2½ per cent. Your company is now entirely free from floating debt.

"The board received with great regret the resignation of Mr. Thomas A. Scott as President of your company on June 1 last. He had occupied that position for five years and had been a director for 12 years prior thereto, to the great advantage of the company, but failing health compelled him to give up active duty. Your directors are gratified, however, to be still able to avail themselves of the valuable counsel resulting from his long experience and thorough knowledge of all matters pertaining to railways. Mr. George B. Roberts was chosen President to fill the vacancy caused by the resignation of Mr. Scott. Since your last annual meeting the board has lost by death two of its most efficient members—Messrs. William Calder and M. B. Sellers, both of whom had been actively interested in the management of your property. Their places were filled by the selection of Mr. Henry Gilbert, of Harrisburg, and Mr. Harry Walters, of Baltimore."

Gulf, Colorado & Santa Fe.

This road is now in operation from Galveston, Tex., to Rogers, 205 miles. There are 9 miles of sidings. The company was chartered May 28, 1873. Construction commenced in May, 1875, and road completed to Arcola near the close of 1877, and to Richmond near the close of 1878. At Arcola connection is made with the Columbia Division of the International & Great Northern; at Richmond with the Galveston, Harrisburg & San Antonio. The company is entitled to the state land grant of 16 sections of land (of 640 acres each) for each mile of road built and equipped. The road was sold and reorganized April 15, 1879, and in the July following the temporary bridge over the Brazos River was replaced by a permanent iron structure costing over $45,000, and from this time the extension of the line was rapidly advanced.

On Aug. 1, 1880, the company leased from the International & Great Northern the right of running its trains over that portion of the Columbia Division between Arcola and Houston, 19 miles, and on same date opened for traffic its line from Galveston to Brenham, 126 miles, connecting there with the Western Division of the Houston & Texas Central. On Sept. 4 the line was opened to Caldwell, in Burleson County, on Sept. 21 to Milano, in Milano County (there connecting with the Brazos Division of the International & Great Northern). On Oct. 22 the line was opened to Cameron, and on Dec. 9 to Rogers, 205 miles from Galveston, its southern terminus. The company is rapidly extending its line, and on Feb. 26 reached Belton, in Bell County, 226 miles from Galveston. The fiscal year ends July 31, but the company sends us the following statement for five months ending Dec. 31.

The equipment consists of 15 engines; 8 passenger and 4 baggage, mail and express cars; 155 box, 235 flat and 28 stock cars; 10 wood and 8 service cars.

The general balance sheet is as follows:

Stock		$1,450,000.00
Funded debt		2,456,000.00
Connecting roads, balances		76,112.00
Vouchers and pay-rolls, December		128,823.34
Current accounts		367,229.88
Net traffic earnings		151,187.22
Total		$4,629,352.44
Cost of road ($18,257 per mile)	$3,742,808.70	
Equipment ($1,494 per mile)	306,269 23	
Real estate and buildings	221,183.54	
Construction telegraph line	24,783.72	
Materials and fuel on hand	14,442.02	
Current accounts	193,305.35	
Cash in hands treasurer	126,559.88	
		$4,629,352.44

The funded debt consists of first-mortgage 7 per cent bonds, dated July 1, 1879, and having 30 years to run. The amount authorized on the road to Belton is $2,712,000, being $12,000 per mile.

The traffic for the five months was as follows:

Train mileage, passenger	64,460
" " freight	68,650
" " mixed	6,881
Total	139,991
Passengers carried	17,201
Passenger mileage	938,020
Tons freight carried	112,918
Tonnage mileage	9,193,741

Included in the freight carried was 187,720 bales of cotton.

The earnings for the five months were as follows:

Passengers	$30,786.89
Freight	277,484.92
Mail, express, etc	8,567.54
Total ($1,853 per mile)	$316,839.35
Expenses (52.28 per cent.)	165,652.13
Net earnings ($884 per mile)	$151,187.22

The semi-annual interest due on the bonds Jan. 1 was $85,960. The road seems already to have developed a considerable business.

Maine Central.

This company works 355 miles of road, whereof 307.5 miles are owned and 47.5 leased. The following statements are from advance sheets received from the company of the forthcoming report for the year 1880.

The general account, somewhat condensed, is as follows:

Stock ($11,718 per mile)		$3,603,300.00
Stock-bonds		16,800.08
Bonded debt		8,703,476.00
Interest scrip		10,892.00
Portland & Kennebec stock not converted		800.00
Accounts, accrued rentals, unclaimed coupons, etc.		23,492.10
Profit and loss		361,431.19
Total		$12,720,191.37
Construction and equipment ($37,970 per mile)	$11,675,182.78	
Androscoggin lease	768,333.33	
Stocks and bonds	20,000.00	
Bills and accounts receivable	76,656.70	
Fuel and materials	172,036.84	
Cash	7,981.72	
		$12,720,191.37

The bonded debt decreased $742.88 during the year; it is made up as follows:

Portland & Kennebec loan, first mortgage, 6s	$217,300.00
Portland & Kennebec, funded interest, 6s	3,676.08
Androscoggin & Kennebec loan, 6s	1,100,000.00
Androscoggin R. R., Bath loan, 6s	425,000.00
Portland & Kennebec consols, 6s	1,166,700.00
Maine Central Extension, 6s	496,500.00
Leeds & Farmington, 6s	633,000.00
Maine Central, $1,100,000 loan, 7s	756,800.00
Maine Central consols, 7s	3,904,500.00
Total	$8,703,476.08

The yearly interest charge on this debt is $568,804.71, being $1,850 per mile owned.

The earnings for the year were as follows:

	1880.	1879.	Inc. or Dec.	P.c.
Passengers	$730,567.84	$610,424.79	I. $120,143.95	19.7
Freight	890,762.55	793,699.38	I. 97,063.17	12.2
Mail, etc	98,722.04	104,252.85	D. 5,530.81	5.2
Miscellaneous	6,660.41	10,159.60	D. 3,499.19	12.1
Total	$1,726,712.84	$1,518,536.62	I. $208,776.12	13.3
Expenses	1,067,148.76	869,979.30	I. 197,169.37	22.9
Net earn'gs.	$659,564.08	$648,557.23	I. $11,006.85	1.7
Gross earn. per mile	4,863.93	4,277.57	I. 586.41	13.3
Net earn. per mile	1,857.93	1,826.92	I. 31.01	1.7
Per cent. of exp.	61.25	57.29	I. 3.97	....

The expenses increased about as much as the earnings, leaving very little change in net earnings. The details of the expenses were as follows:

Fuel	$173,312.11
Maintenance of way	318,645.69
Train expenses	353,974.90
Station expenses	175,714.62
Office establishment	31,200.61
General expenses	15,801.43
Total	$1,067,148.76

Maintenance of way expenses include 2,000 tons steel rails and 51,800 new ties; the cost of 50 freight and 3 caboose cars.

The income and profit and loss accounts were as follows:

Net earnings, as above		$659,564.08
Interest on bonds	$569,058.72	
Interest on temporary loans	1,013.76	
Rent, Belfast & Moosehead Lake	36,000.00	
Rent, Dexter & Newport	18,000.00	
		624,072.48
Surplus for the year		$35,491.60
Discount on scrip taken up		96.00
Balance, Dec. 31.1879		328,309.29
Total		$363,896.89
Old accounts charged off		2,465.70
Balance, Dec. 31, 1880		$361.421.19

During the year 714,974 passengers and 451,534 tons of freight were carried, a large increase. The year shows a considerable gain for the road, as large as could be expected from the country which it serves.

Chicago & Alton.

At the close of the calendar year 1880, which is covered by the eighteenth annual report of this company, the mileage worked was as follows:

	Main track.	Second track.	Sidings.
Chicago to Joliet, leased	37.20	37.04	18 81
Joliet to East St. Louis	243.50	25.58	63.87
Coal City Branch	27.84	.....	5.68
Dwight to Washington and Lacon	38.10	.....	7.16
Roodhouse to Louisiana	79.80	.....	6 86
St. L., Jacksonville & Chi., leased	150.60	.....	13.82
Louisiana & Mo. River, leased	100.80	.....	16.06
Mexico to Kansas City, leased	162.62	.....	26.19
Total	840.46	62.62	158.45

The total mileage of all tracks was 1,061.53 miles, whereof 728.51 miles are laid with steel; 73.55 miles of steel were laid in 1880.

The equipment includes 207 locomotives; 105 passenger train cars; 16 Pullman sleeping cars; 2,923 box, 1,148 stock, 1,200 flat and coal and 97 caboose and drovers' cars; 15 service cars. There are 75 engines with the Westinghouse automatic air brake, one with Eames' vacuum and one with Card steam brake. Twenty locomotives, 6 passenger, 1 postal and 1,100 freight cars were added last year.

The general account, condensed, is as follows:

Stock, preferred		$2,425,400 00
" common		11,181,841.23
" old scrip outstanding		72.00
Total stock		$13,607,313.23
Bonds		12,005,950.00
Bonds paid and cancelled		661,000.00
Current accounts, December wages, etc		609,443.50
Kan. City, St. L. & Chi. accounts		991,043.61
St. L., Jack. & Chi		148,606.19
Joliet & Chicago special account		33,531.00
Rents accrued		142,741.67
Stocks and bonds unissued		34,572.00
Sundry balances		5,702.45
Income account		1,500,410.10
Total		$29,740,373.75
Road and property accounts	$23,430,012.41	
Materials	530,645.54	
Cash accounts	1,090,003.00	
Bills and accounts receivable	539,692.98	
Stocks and bonds owned	3,826,321.40	
T. B. Blackstone, Trustee	127,600.00	
Sundry special deposits	101,502.55	
Current accounts	94,594.97	
		29,740,373.75

The total amount of bonds, including leased line bonds assumed and deducting some bonds redeemed by sinking funds, is $12,981,950. The report says:

"The amount of common capital stock has been increased 11,160 shares, which have been sold by our company for the purpose of providing additional equipment, and the amount of bonded indebtedness has been reduced by the cancellation of $61,000 of sinking fund bonds since the date of our last annual report.

"Our company has expended large sums obtained from time to time by the sale of its stock and bonds for permanent additions to its leased lines and for rolling stock used on them.

"The leases are perpetual, and the property thus held may be considered as owned, subject to the payment of annual rent.

"By capitalizing, at 7 per cent., the amount of annual rent to be paid in addition to that represented by coupons on the several amounts of bonds before stated we arrive at the following result:

Stock and bonds of company	$26,588,822.00
Capital represented by the Joliet & Chicago, less $206,000 of bonds	1,500,000.00
St. L., J. & C. R. R. (based on last year's earnings)	5,404,773.00
Kan. City, St. L. & Chi., less $3,000,000 of first-mortgage bonds, owned by our company	1,743,650.00
Louisiana & Missouri River (based on earnings of last year)	2,284,532.28
Mississippi River Bridge Co. (less $700,000 bonds)	300,000.00
Total capital account	$37,821,727.28

"This sum includes the cost of our bridges over the Mississippi and Missouri rivers, rolling stock, and all other property held by our company. If divided by the number of miles of main line it is equal to $45,239 per mile. If divided

REPORTS OF NEW YORK RAILROADS TO THE STATE ENGINEER AND SURVEYOR FOR THE YEARS ENDING SEPT. 30, 1880, AND SEPT. 30, 1879.

NAME of ROAD.	YEAR.	Miles of road	Miles of track	Number of locomotives	Number of Cars. 1st class pass.	2d class pass.	Baggage, mail and express.	Freight	Capital stock	Funded debt	Floating debt	Cost	Train Miles. Passenger	Freight	Service
58. Syracuse, Chenango & New York	1880	43.5	45.5	4	2	4	3	75	891,400	261,400	78,192	1,091,944	‡91,537		
	1879	43.5	45.5	3	6		2	60	801,400	261,400		1,089,660	‡84,920		
59. Syracuse, Geneva & Corning*	1880	57.8	68						1,162,800	1,542,300		2,743,925	108,228	204,087	
	1879	57.3	68						1,162,900	1,153,000		2,664,523	107,880	209,957	
60. Utica & Black River	1880	180.1	193.3	20	23		10	235	1,772,000	1,112,000	55,226	2,808,049	286,030	146,846	
	1879	180 1	193	18	23		10	210	1,771,720	1,112,000		2,797,586	289,504	143,336	
61. Utica, Chenango & Susquehanna Valley†	1880	97.4	111.9	17	14	2?-2	5	61	4,000,000		150,145	4,150,145	141,317	249,176	
	1879	97.4	111.2	17	14			61	4,000,000		149,071	4,149,071	141,228	241,674	
62. Utica, Clinton & Binghamton†	1880	31.3	37.5	2	3			22	636,285	800,000	40,000	1,422,812	32,824	25,658	
	1879	31.3	36.8	2	3		2	22	640,326	800,000	53,500	1,299,517	24,284	22,518	
63. Utica, Ithaca & Elmira	1880	71.1	73.4	9	10		5	104	2,000,000		241,464	2,209,661	97,643	71,706	
	1879	71.1	73.4	11	10		5	102	2,000,000		207,338	2,883,472	106,022	68,332	
64. Valley†	1880	11.6	22.28						750,000		241,925	991,925	28,22?	204,134	
	1879	11.5	22.28					22	750,000		99,198	849,198	26,698	194,155	
65. Wallkill Valley	1880	35.5	38.5	2	2		3	22	330,000	580,000	104,376	326,858	50,490	35,288	
	1879	35.5	38.5	2	2		3	18	330,000	532,000	101,737	298,798	48,100	32,728	
66. Warwick Valley	1880	21.6	22.9	2	2		1		340,000	210,000	119	441,388	23,617		
	1879	10.2	10.6					9	225,000	60,000		199,181	14,500		
67. Bath & Hammondsport	1880	9.4	9	1	3		1	10	75,350	38,000	4,200	123,116	7,360	14,720	
	1879	9.1	9 1	2	3		1		75,350	38,000	1,000	132,151	21,020		
68. Syracuse, Chenango & New York	1880	43.5	45.5						801,400	261,400	73,192	1,091,943	‡91,537		
	1879	43.5	45.5	3			2	60	801,400	261,400		1,089,660	‡84,920		

NAME OF ROAD.	YEAR.	Number of passengers.	Passenger miles	Tons carried	Ton-miles	Gross Earnings. Passenger	Freight	Other	Total	Working Expenses. Maintenance of road	Maintenance of equipment	Operating	Total	Net earn.	Interest	Rentals	Dividends
						$	$	$	$	$	$	$	$	$	$	$	$
58	1880	99,818	1,597,088	51,117	894,547	38,448	37,052	7,634	83,134	32,914	9,059	31,047	73,050	10,683	18,298		
	1879	85,417	1,366,812	50,178	865,570	33,643	32,893	5,742	72,278	30,634	6,140	30,947	67,721	4,557	792		
59	1880	72,210	1,434,719	939,906	45,627,284	30,429	383,364	4,722	418,510	68,335	128,038	46,281	242,655	175,861		120,192	
	1879	62,552	1,289,701	695,251	35,262,582	29,602	310,891	9,473	349,967	63,322	133,824	26,701	223,846	126,421	84,075		
60	1880	236,656	5,836,606	160,932	9,204,785	220,351	334,800	50,166	605,317	90,322	44,703	139,864	274,889	330,322	81,340	70,219	70,832
	1879	213,019	5,221,906	1.8,880	6,062,017	190,857	259,599	35,793	486,250	126,598	26,073	137,86?	290,532	195,717	81,340	67,167	35,416
61	1880	227,731	4,439,320	281,810	19,029,438	126,897	399,767	17,952	544,616	94,279	24,440	164,024	282,743	261,873			240,000
	1879	224,841	4,390,642	300,841	16,587,833	118,939	357,171	17,903	494,012	83,036	17,905	173,745	274,687	219,325			240,000
62	1880	78,948	889,344	112,647	1,773,317	26,230	50,634	4,680	82,553	20,385	2,351	29,091	51,827	30,729		70,500	
	1879	73,952	836,425	69,761	1,312,715	23,810	31,783	5.535	61,128	19,579	1,707	27,529	48,814	12,313		70,000	
63	1880	98,943	2,259,402	82,400	3,267,269	59,120	67,144	16,693	142,957	50,402	16,549	74,428	141,379	1,578			
	1879	100,026	2,312,613	89,003	3.612,068	57,333	75,069	24,609	156,951	59,291	15,064	86,702	161,057	Deficit.			
64	1880	48,738	557,071	1,704,095	18,694,829	16,953	264,781	2,907	284,642	31,297	28,811	57,412	117,521	167,121			60,000
	1879	63,058	642,241	1,394,726	15,393,831	16,067	243,298	2,903	262,269	23,151	21,207	51,634	96,653	165,601			60,000
65	1880	78,195	1,081,708	65,825	1,134,584	28,577	59,575	12,608	100,760	28,815	7,679	42,932	79,428	21,333	23,897		
	1879	69,850	984,518	60,738	983,153	25,883	54,486	4,642	85,012	26,315		37,969	70,589	14,423	17,803		
66	1880	26,878	293,610	21,686		7,895	33,105	2,886	43,885	8,250	489	17,732	26,472	17,413	10,674		
	1879	23,761	190,480	22,185		5,541	28,326	3,141	37,008	5,140		15,827	20,968	16,041	4,200		7,875
67	1880	18,396	50,810	5,081	49,335	4,108	6,408	403	10,918	1,677	265	5,978	7,920	2,998	2 660		
	1879	14,266	140,260	4,900	48,000	4,942	7,139	304	11,575	1,254	362	4,978	6,565	5,019	2,660		
68	1880	99,818	1,597,088	51,117	894,547	38,448	37,052	7,634	83,144	32,914	9,089	31,047	73,050	10,083	18,298		
	1879	85,417	1,366,812	50,178	865,570	33,643	32,893	5,742	72,278	30,634	6,140	30,947	67,721	4,557	792		

* Leased to Fall Brook Coal Company. † Operated by Delaware, Lackawanna & Western. ‡ Mixed trains only run.

by the number of miles of all tracks it is equal to $35,629 per mile.

"Excluding the cost of the bridges over the Mississippi and Missouri rivers, the remainder, including all other property, is equal to $43,584 per mile of main lines and branches, or $34,239 for each mile of track."

The traffic for the year was as follows:

	1880.	1879.	Inc. or Dec.	P. c.
Passengers carried	1,203,549	843,429	I. 360,120	42.7
Passenger mileage	78,270,505	54.219,072	I. 24,051,493	44.4
Tons freight carried	3,071,788	2,634,177	I. 437,611	16.6
Tonnage mileage	481,474.730	402,234,396	I. 79,240,334	19.7
Av. receipt:				
Per passenger per mile	2.076 cts.	2.419 cts.	D. 0.343 ct.	14.2
Per ton per mile	1.206 "	1.054 "	I. 0.152 "	14.4

Of the passengers carried 91.64 per cent. were local; the average rate per mile for local passengers was 2.183 cents. The large increase in passengers and the decrease in the average rate suggests the Southwestern passenger wars of last year, which were doubtless the chief causes of this result.

Local freight furnished 73.76 per cent. of the whole tonnage. The coal tonnage was 989,146 tons, an increase of 171,845 tons, or 21 per cent, over the previous year.

The business to and from the three terminal cities was as follows:

	—Passengers.— 1880.	1879.	—Tons freight.— 1880.	1879.
To Chicago	86,753	78,862	1,248,619	1,074,125
From "	93,383	91,789	465,121	430,301
To St. Louis	64,067	78,860	444.219	354,174
From "	71,061	75,901	329,750	339,996
To Kansas City	39,041	27,041	308,233	204,095
From " "	36,713	27,388	236,130	135,508

East St. Louis and Venice deliveries are included in St. Louis. The decrease of St. Louis passenger business is notable. It is also to be noted that the road took away less freight from Kansas City than it carried to that place. Company's freight is not included in the figures above.

Some statistics of train and car mileage are as follows:

Train miles:	1880.	1879.	Inc. or Dec.	P. c.
Passenger	1,406,752	1,113.791	I. 292,991	26.0
Freight	2,716,778	2,495,847	I. 220,931	8.8
Car miles:				
Passenger-train	7,038,155	5,832,970	I. 1,250,185	21.5
Freight	64,028,817	52,668,937	I. 11,359,880	21.6
Av. train load:				
Passengers, No	55.64	48.68	I. 6.96	14.2
Freight, tons	177.00	161.00	I. 16.00	9.9
Av. tons per loaded car	10.14	10.26	D. 0.12	1.1
Av. tons per car, all cars	7.52	7.64	D. 0.12	1.6
Per train mile:				
Receipts, passenger	132.00 cts.	136.00 cts.	D. 4.00 cts.	3.0
Receipts, freight	214.00 "	170.00 "	I. 44.00 "	25.9
Receipts, average	186.00 "	159.45 "	I. 26.55 "	16.7
Cost	98 50 "	84.48 "	I. 14.02 "	16.4
Net receipt	87.50 "	75.00 "	I. 12.50 "	16.7

Of the freight car mileage 21.56 per cent. was of empty cars. Chicago & Alton cars ran 15,023,781 miles on foreign roads, and foreign cars ran 12,396,036 miles on this road. The report says:

"There was consumed, in operating your lines during last year, 230,111 tons of coal; average cost per ton delivered on locomotive tender, $1.28. Also 5,885 cords of wood; cost on tender, $2.12 per cord.

"There was paid for labor, including improvements, during the year 1879, $1,964,622.43; in 1880, $2,411,475.40.

"The average number of men employed was, in 1879, 3,589; in 1880, 4,108.

"Of the whole amount of operating expenses, 54.66 per cent. was paid for labor and personal services; 35.56 per cent. for supplies of various kinds purchased, and 9.78 per cent. for miscellaneous expenses.

The earnings for the year were as follows:

	1880.	1879.	Increase.	P. c.
Passengers	$1,624,668.08	$1,311,708.17	$312,959.91	23.9
Freight	5,808,484.30	4,242,791.39	1,565,692.91	36.9
Express	142,064.97	111,806.69	30,258.28	27.6
Mail	88,530.24	88,530.24		
Miscellaneous	23,478.39	840.70	22,637.69	
Total	$7,687,225.98	$5,755,677.19	$1,931,548.79	33.6
Conducting transp.	1,168,374.56	905,145.86	263,228.70	29.1
Motive power	1,149,530.15	806,140.52	235,161.77	25.7
Maintenance of cars	379,148.39	268,767.65	110,380.74	41.1
Maintenance of way	1,170,338.11	806,140.52	364,197.59	45.2
General exps.	194,432.53	155,098.22	39,334.31	25.4
Total	$4,061,823.74	$3,049,520.63	$1,012,303.11	33.2
Net earn	$3,625,402.24	$2,706,156.56	$919,245.68	34.0
Gross earn. per mile	9,146.45	7,313.44	1,833.01	25.1
Net earn. per mile	4,313.60	3,438.57	875.03	25.4
Per cent. of exps	52.82	52.98		

No compensation has yet been fixed for the transportation of the mails between Mexico and Kansas City.

The income account, condensed, is as follows:

Balance, Dec. 31, 1879		$579,373.22
Interest and dividends on securities owned		269,505.54
Gross earnings of road		7,687,225.98
Total		$8,536,104.74
Interest on funded debt	$802,097.75	
Dividends	854,359.00	
Rentals	1,067,991.08	
Damages, swage block patent case	50,192.62	
From this account for new cars, etc.	16,683.34	
Sinking fund	35,129.58	
Taxes	147,417.53	
Working expenses	4,061,823.74	7,035,694.64
Balance, Dec. 31, 1880		$1,500,410.10

The net earnings during the year 1880, after deducting operating expenses, taxes, interest on bonds, rent, losses and all sums charged in the income account, are equal to 13.05 per cent. on the capital stock, both common and preferred.

The report says: "The earnings on each of the lines held and operated under lease were larger than in 1879.

"No separate account of the earnings of the Joliet & Chicago Railroad is kept. The rent is fixed by the terms of a perpetual lease at 7 per cent. per annum on the capital stock of that company, amounting to $1,500,000, with a covenant by our company to pay the interest and principal of its mortgage bonds at maturity, the amount of which now uncanceled is $306,000. The net earnings of this road have at all times exceeded the amount of rent paid for its use.

"The St. Louis, Jacksonville & Chicago Railroad earned $742,798.10 in 1879, and $965,768.01 in 1880; increase, $222,969.91, or 30 per cent.

"The Louisiana & Missouri River Railroad earned $317,756.59 in 1879, and $467,924.50 in 1880; increase, $150,167.91, or 47.26 per cent.

"The operation of the Kansas City, St. Louis & Chicago road under the terms of the lease commenced on Nov. 1, 1879. The earnings of the road in 1880 were $1,261,991.56, or $7,742.28 per mile.

"The operation of the leased lines during the last year has afforded a continued demonstration of their great value to our company.

"During the last year $1,133,124.57 was expended for additional depot grounds, buildings, side tracks, locomotives and cars, of which sum $1,116,441.23 was derived from the sale of 11,160 shares of the common capital stock of our company, and the balance, amounting to $16,683.34, was paid from income account.

"The condition of the property of our company has been, in all departments, fully maintained during the last year, and in many respects greatly improved.

"There now remain on our lines between Chicago and Kansas City, Chicago and St. Louis, and St. Louis and Kansas City, only 38.38 miles of iron rails in main tracks, all of which will be replaced with steel rails, now under contract, to be delivered early in 1881.

"Contracts were made last year for the erection of 22 iron bridges, to take the place of an equal number of wooden ones, but by reason of unexpected delays, only part of that number were completed at the close of the year.

"The substitution of steel and iron for wood in bridges has been continued until very few bridges of wood now remain on our lines.

"The work of reducing the inclination of the steepest grades on the several divisions of our road has been continued during the last year, and has been completed on the division between Chicago and Bloomington, 126 miles. The maximum inclination of grades on that division, in the direction of our largest traffic, is now 24 feet per mile.

"This improvement will be of great value in reducing the cost of transportation. Considerable work of the same kind has been done during the last year between Louisiana and Mexico."

Eureka & Palisade.

This company owns a line from Palisade, Nev., to Eureka, 90 miles, with a branch from Eureka to Ruby Hill, 7 miles. A statement submitted to the Nevada Legislature gives the following figures for 1880:

Gross earnings ($4,582.81 per mile)	$444,532 38
Expenses (44.16 per cent.)	196,299.44
Net earnings ($2,559.10 per mile)	$248,232.94

The cost of the road is reported at $1,566,616.73, or $16,150 per mile; the road is of 3 ft. gauge. The net earnings given above were 15.84 per cent. on the cost of the road. The line serves several mining districts, and has a moderate traffic at high rates.

Union Pacific.

The following figures are from the report for 1880, read at the annual meeting, March 9.

There were $228,000 land-grant bonds canceled during the year, leaving $6,071,000 outstanding. To meet these there are on hand $4,533,745.46 in cash and land contracts.

The earnings for the year were as follows:

	1880.	1879.	Increase.
Passengers	$5,171,115	$4,236,870	$934,245
Government troops	234,010	169,928	64,082
Freight, cash	13,406,910	10,572,805	2,834,105
" gov't	469,025	443,435	25,590
" Co.'s	1,342,572	1,051,155	291,417
Mail	719,350	685,713	33,637
Express	681,818	496,218	185,600
Miscellaneous	430,334	384,142	46,192
Total	$22,455,134	$18,040,266	$4,414,868
Expenses	10,545,119	8,368,837	2,176,282
Net earn	$11,910,015	$9,671,429	$2,238,586
Per cent. of exps	46.96	46.38	0.58

The net receipts from the land grant for the year were $957,518.49, of which $669,346.74 were from Union Pacific grant, $268,417.32 from Kansas Pacific grant and $19,754.43 from other lands.